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THE EFFECTS OF VARIOUS NUMBERS OF TOPICAL APPLICATIONS OF SODIUM FLUORIDE

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PREVIOUS studies of the topical application of sodium fluoride, made by Knutson and Armstrong[1,2] and by Bibby,[3] have shown that this method is effective in reducing the incidence of dental caries in the treated teeth. In one of these studies,[1] the number of treatments with a 2 per cent solution of sodium fluoride varied from seven to fifteen, and the occurrence of dental caries in the treated teeth was reduced approximately 40 per cent. Eight applications proved to be as effective as fifteen. The purpose of the present study was to determine the minimum number of applications necessary to obtain the maximum results.

Materials and Methods

This study was made on groups of children in the public schools of Hibbing, Chisholm and Virginia, three cities in northern Minnesota. The study was made on the suggestion and with the supervision and assistance of the Division of Dental Health, Minnesota Department of Health. Each city has a full-time school dentist working in a fairly well equipped dental office. The children included in the study were examined and treated in these offices.

Before the study was begun, the dentists conferred with Dr. John W. Knutson, Senior Dental Surgeon of the United States Public Health Service, to determine the number of treatments to

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1. Knutson, J. W., and Armstrong, W. D.: The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. Pub. Health Rep. 58:1701, November 19, 1943.

2. Knutson, J. W., and Armstrong, W. D.: The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. II. Report of Findings for Second Study Year. Pub. Health Rep. 60:1085, September 14, 1945.

3. Bibby, B. G.: Use of Fluorine in the Prevention of Dental Caries. J. A. D. A. 31: 228, February 1, 1944.

be given in each city and to learn the dental examination coding system and the technic of the treatments.

In September 1944, parental permission was obtained to treat 1,130 school children in the three communities. Ages of the children ranged from 6 to 12 years. The children included were from kindergarten and the first six grades. A 2 per cent solution of sodium fluoride was used throughout this study, and the same procedure was used in each school.

Dr. Allison, of Hibbing, applied one treatment to the teeth of 300 children. Dr. Jordan, of Chisholm, applied two treatments to the teeth of 630 children. Dr. Wood, of Virginia, applied three treatments to the teeth of 200 children.

Prior to the applications, each child received a prophylaxis, consisting of scaling and polishing the teeth, and a detailed dental examination. The examinations were made by a dentist, with mouth mirror and explorer, under good light. Only the teeth in half of the mouth of each child were treated—one upper and one lower quadrant. The teeth in the untreated half of the mouth were used as controls. In the Hibbing and Chisholm studies, the sodium fluoride was applied on the left side for the first child, on the right side for the second child, and so on, alternately. In the Virginia study, all treatments were given on the left side only.

The treatment, after prophylaxis, consisted of isolating with cotton rolls the teeth to be treated, drying them with compressed air, and applying to the crowns of the teeth, by means of a cotton swab, a 2 per cent solution of sodium fluoride. This solution first was applied to the buccal surfaces of the teeth, then to the lingual, and lastly to the occlusal. The interproximal surfaces also were wetted by this method. The teeth were kept free of saliva and the mouth was held open for four minutes after the application. At the end of that time, the solution had dried on the teeth. In the schools where more than one treatment was administered, the treatments were given one week apart. Second and third treatments were not preceded by other than the initial prophylaxis.

In the fall of 1945, approximately one year after the fluoride treatments had been administered, the teeth of the children in all the schools were re-examined. The second examination was made by the same person and with the same equipment as the first. It included all the treated children who were still available. Table 1 gives the total number of children treated in 1944 who were available for re-examination in 1945, and the numbers treated on left and right sides, respectively.

Prophylaxis

Each child received a careful and complete prophylaxis which included the use of pumice with rubber cups, scaling wherever necessary, sanding interproximal spaces with strips and removing all stain possible. The objective was to have the tooth as clean as possible before applying the solution. Prophylaxes were done by the dental hygienist.

Time and Cost

The elements of time and cost are vital in a public health project like this one. A study of these elements was made with the largest group, which consisted of the 630 Chisholm children who received fluoride treatments in 1944.

Table 1.—Children examined in 1944 and re-examined in 1945, who were given treatments of a 2 per cent solution of sodium fluoride

	Total	Left Side	Right Side
Hibbing (1 treatment)....	241	119	122
Chisholm (2 treatments)..	575	282	293
Virginia (3 treatments)...	161	161	.....

The average time required for giving a prophylaxis was about ten minutes per child. Sometimes a little more than ten minutes was required for the older children and a little less for those in kindergarten and first grade. The time required for the fluoride treatment averaged one and a half minutes per child. The one and a half minutes includes the time required for placing of cotton rolls, drying the teeth with compressed air, and applying the solution to the teeth. The drying time after the application of the solution was about four minutes. In the Chisholm study, four children were allowed to occupy chairs other than the dental chair while the solution was drying on their teeth. By this method, the dentist was able to carry on the treatments continually without waiting between patients.

Approximately three minutes were occupied in changing from one patient to the next in the dental chair. Working hours were from 9 a.m. to 12 noon and from 1 to 4 p.m. When the time required for prophylaxis and for treatment were combined, the average number of patients treated was fifty per day. All prophylaxes were done by a dental hygienist, and all applications of sodium fluoride by a dentist. The dental hygienist averaged thirty children per day for prophylaxes.

The cost of materials used in the Chisholm study totaled $97.70, or about 15 cents per child. Materials used included:

1,000 cotton rolls
2 boxes applicators
3 doz. B.S. polishers
4 lb. silex
4 doz. brushes
Drinking cups
4 pr. cotton holders
2 pkg. absorbent cotton
2 boxes abrasive strips
1¼ qt. 2 per cent solution of sodium fluoride
2 handpieces
Laundry

Including the re-examination in the fall of 1945, the entire Chisholm study took about two months. Considering materials, salaries of personnel, cost of examinations, prophylaxes, treatments and re-examinations, the cost was approximately $1.60 per child.

Findings

Hibbing Study (One Application).—An analysis of the data obtained from the study conducted on the children in Hibbing is presented in Table 2. In the fall of 1945, 241 children were re-exam-

Table 2.—Results of one application of 2 per cent solution of sodium fluoride, given to 241 children in Hibbing (D = deciduous; P = permanent)

	Treated Left				Untreated Right				Treated Right				Untreated Left			
	Upper		Lower		Upper		Lower		Upper		Lower		Upper		Lower	
	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P
No. sound teeth, 1944	178	334	136	355	181	319	134	362	211	325	149	352	194	306	155	350
Sound teeth, 1944, which were carious or filled in 1945:																
Number	21	25	13	18	29	21	10	16	25	19	19	15	28	28	15	16
Per cent	11.8	7.5	9.6	5.1	16.0	6.6	7.5	4.4	11.8	5.8	12.8	4.3	14.4	9.2	9.7	4.6
No. surfaces carious or filled of teeth which were carious or filled in 1945	31	29	25	19	58	25	15	23	38	21	48	17	41	33	24	17
No. additional surfaces carious or filled of teeth which were carious or filled in 1944	34	4	47	13	36	2	42	10	51	11	30	7	50	10	29	12

Table 3.—Results of two applications of 2 per cent solution of sodium fluoride, given to 575 children in Chisholm (D = deciduous; P = permanent)

	Treated Left				Untreated Right				Treated Right				Untreated Left			
	Upper		Lower		Upper		Lower		Upper		Lower		Upper		Lower	
	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P
No. sound teeth, 1944	497	533	473	655	527	534	421	542	540	558	440	676	533	551	448	654
Sound teeth, 1944, which were carious or filled in 1945:																
Number	41	46	29	41	54	68	34	53	50	42	16	50	40	28	31	50
Per cent	8.2	8.6	6.1	6.3	10.2	12.7	8.1	9.8	9.3	7.5	3.6	7.4	7.5	5.1	6.9	7.6
No. surfaces carious or filled of teeth which were carious or filled in 1945	57	65	35	45	72	76	44	61	74	47	19	57	51	42	38	60
No. additional surfaces carious or filled of teeth which were carious or filled in 1944	99	32	89	40	90	48	106	45	60	19	58	23	68	32	77	31

ined after having received one treatment with a 2 per cent solution of sodium fluoride in the fall of 1944. The remainder of the children who had been treated in 1944 had moved away, or for some other reason were not available for re-examination.

The number and percentage of sound teeth that became carious or were filled between the time of the treatment in the fall of 1944 and the re-examination in the fall of 1945 are presented in Table 2. The treated upper quadrants on both the right and the left sides of the deciduous teeth show some advantage from the single topical application of sodium fluoride. The treated lower quadrants of both the deciduous and the permanent teeth failed to show any benefit from the single application of sodium fluoride.

The data presented in Table 2 indicate that there is a difference of 4.9 per cent between the treated and the untreated quadrants, in favor of the treated quadrants, of both the deciduous and the permanent teeth. These findings indicate that one application of sodium fluoride apparently had only a slight effect in preventing dental caries, and this effect was confined to the upper quadrants.

Chisholm Study (Two Applications).—Of the 630 children treated at Chisholm in 1944 with two applications of a 2 per cent solution of sodium fluoride, 575 were available for re-examination in the fall of 1945. The analysis of the data on these children is shown in Table 3.

A comparison of the number of teeth which became carious or were filled among the untreated and the treated teeth is shown in Table 4, A.

Combining the findings for the treated and the untreated quadrants, we find that the results are better than those found after the single application of sodium fluoride given in the Hibbing study. In the Chisholm study, 14.5 per cent less caries developed in the treated deciduous teeth than in those untreated, and 10 per cent less caries developed in the treated permanent teeth than in the untreated ones. Treated left quadrants of deciduous teeth showed better results than treated right quadrants; only eight new surfaces became carious or were filled in the treated left quadrants, as compared with twenty-seven in the treated right quadrants.

Virginia Study (Three Applications).—Table 5 gives the findings in the Virginia study, in which three applications of a 2 per cent solution of sodium fluo-

Table 4.—Number of carious or filled teeth among treated and untreated teeth

Deciduous		Permanent	
A (Chisholm)			
Untreated upper right	54	Untreated upper right	68
Treated upper left	41	Treated upper left	46
Difference: 13		Difference: 22	
Untreated lower right	34	Untreated lower right	53
Treated lower left	29	Treated lower left	41
Difference: 5		Difference: 12	
Treated upper right	50	Treated upper right	42
Untreated upper left	40	Untreated upper left	28
Difference: −10 (negative)		Difference: −14 (negative)	
Treated lower right	16	Treated lower right	50
Untreated lower left	31	Untreated lower left	50
Difference: 15		Difference: 0	
B (Virginia)			
Untreated upper right	14	Treated upper left	31
Treated upper left	7	Untreated upper right	46
Difference: 7		Difference: 15	
Treated lower left	2	Treated lower left	18
Untreated lower right	1	Untreated lower right	16
Difference: −1 (negative)		Difference: −2 (negative)	

ride were given to 200 children, 161 of whom were available for re-examination. Only those children who were enrolled in the third through the sixth grades were included in this study, and all treatments were given on the teeth in the left quadrants. The treated upper quadrants showed better results than the treated lower quadrants. The number of teeth becoming carious or filled during the period of the study are shown in Table 4, B.

The combined treated quadrants of the deciduous dentition show 40 per cent fewer teeth becoming carious or filled in the treated than in the untreated teeth. However, the total number of deciduous teeth affected was extremely small, so the extent of this difference may or may not be due to sampling variation alone. Combined totals for the permanent dentition show that 21 per cent less caries developed in the treated teeth than in the untreated teeth. Ob-

Table 5.—Results of three applications of 2 per cent solution of sodium fluoride, given to 161 children in Virginia (D = deciduous; P = permanent)

	Treated Left				Untreated Right			
	Upper		Lower		Upper		Lower	
	D	P	D	P	D	P	D	P
No. sound teeth, 1944	102	591	90	642	117	603	83	626
Sound teeth, 1944, which were carious or filled in 1945:								
Number	7	31	2	18	14	46	1	16
Per cent	6.9	5.2	2.2	2.8	12.0	7.6	1.2	2.6
No. surfaces carious or filled of teeth which were carious or filled in 1945	9	37	4	23	19	52	2	24
No. additional surfaces carious or filled of teeth which were carious or filled in 1944	16	18	16	24	18	18	15	28

Table 6.—Comparison of effects of one, two and three applications of a 2 per cent solution of sodium fluoride (T = treated teeth; U = untreated teeth)

	1 Treatment				2 Treatments				3 Treatments			
	Deciduous		Permanent		Deciduous		Permanent		Deciduous		Permanent	
	T	U	T	U	T	U	T	U	T	U	T	U
No. sound teeth, 1944	674	664	1366	1337	1950	1929	2422	2281	192	200	1215	1229
No. sound teeth, 1944, which became carious or were filled in 1945	78	82	77	81	136	159	179	199	9	15	49	62
Percentage sound teeth, 1944, which were carious or filled in 1945	11.6	12.3	5.6	6.1	7.0	8.2	7.3	8.7	4.7	7.5	4.0	5.0
Percentage less caries in treated than in untreated teeth	4.9		4.9		14.5		10.0		40.0		21.0	

servation of Table 5 indicates that there was little difference in the number of additional surfaces of the treated quadrants that became carious or were filled as compared with the quadrants which were not treated.

Three Studies.—Findings of the three studies indicate a reduction of dental caries corresponding to the increased number of applications of sodium fluoride. However, the maximum results obtained in studies previously reported were not reached in our three treatments. It is therefore evident that more than three treatments are necessary to obtain the maximum results.

Table 6 gives a comparison of results for the three schools included in our study—Hibbing with one treatment, Chisholm with two, and Virginia with three. The total number of carious or filled teeth that developed during the period of the study is shown in Table 7. Thus, for the permanent teeth, two treatments gave a result more than twice as good as that obtained by one treatment, and three treatments gave a result twice as good as that obtained by two.

On the basis of the findings of this study, we may assume that at least four treatments are necessary to accomplish the same results as were achieved in Knutson's study[1,2] with the use of seven to fifteen treatments.

This study indicates that the num-

Table 7.—Number of carious or filled teeth that developed during study

Deciduous		Permanent	
	One Treatment		
Treated quadrants	78	Treated quadrants	77
Untreated quadrants	82	Untreated quadrants	81
Difference: 4 (4.9%)		Difference: 4 (4.9%)	
	Two Treatments		
Treated quadrants	136	Treated quadrants	179
Untreated quadrants	159	Untreated quadrants	199
Difference: 23 (14.5%)		Difference: 20 (10%)	
	Three Treatments		
Treated quadrants	9	Treated quadrants	49
Untreated quadrants	15	Untreated quadrants	62
Difference: 6 (40%)		Difference: 13 (21%)	

ber of treatments has a direct bearing on the results achieved by topical application of a 2 per cent solution of sodium fluoride to children's teeth. It also indicates that three treatments are not sufficient to provide the maximum possible amount of caries control. To achieve maximum results, the minimum number of treatments needs to be more than three. It can be assumed, on the basis of this study and that of Knutson and Armstrong,[1,2] in which seven to fifteen applications were used, that the minimum number of treatments needs to be four or more, but fewer than eight. Topical application of sodium fluoride in one, two or three treatments had little effect on teeth that were previously carious or filled. This study verifies the finding that topical applications of sodium fluoride are effective in lowering the incidence of dental caries.

SHRINKAGE DURING CASTING OF GOLD AND GOLD ALLOYS

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THE problem of the correct evaluation of the shrinkage during casting of inlay casting gold alloys is important from the standpoint of mold compensation. The investigations which have been carried out on this subject may be classified by method as either indirect or direct. The indirect method consists of measuring wax patterns before casting, and then measuring the casting after its completion. Such a method is open to criticism as to (1) the ability to measure the wax pattern with sufficient accuracy, (2) the ability to measure or to take into consideration the change in size of the mold during casting and (3) the ability to measure the final casting with sufficient accuracy. In the direct method, the mold is measured accurately just before the casting is made, and then the casting shrinkage is measured as the difference between the mold dimensions and those of the finished casting. The latter method is by far the more accurate, although the measurement of the casting after it is removed from the mold may be subject to error because of an inability to obtain smooth, specular surfaces on the casting at the points of measurement.

Indirect Method

Two notable examples of investigations by the indirect method are those of Lane and Scheu. Lane[1] is somewhat vague in describing his work, but he appears to have determined the casting shrinkage of pure gold as 1.64 per cent.

Scheu[2] determined the shrinkage of gold alloys by subjecting a measured wax pattern to known values of hygroscopic expansion of the investment. He found that a hygroscopic expansion of 1.6 per cent compensated for the shrinkage of 22-carat gold alloy. Pure gold exhibited a

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†Professor of physics, Dental School, Northwestern University.

1. Lane, J. G., The Casting Process as Applied to Inlays of Gold and Other Dental Uses. *D. Digest* 15: 498 (July) 1909.

2. Scheu, C. H., A New Precision Casting Technic. *J.A.D.A.* 19:639, April 1932. Precision in Casting. *J.A.D.A.* 20:1205, April 1933. Controlled Hygroscopic Expansion of Investment To Compensate for Shrinkage in Inlay Casting. *J.A.D.A.* 22:452 (March) 1935.

higher shrinkage, and hard gold alloys (presumably containing platinum and palladium) shrank less than this value.

Shell[3] adapted wax patterns to a rectangular mold carefully prepared in a steel block. Castings made from these patterns were replaced in the steel mold, and the discrepancies were carefully measured. He found the shrinkage to be 1.71 per cent for castings made in a hot investment mold, and 1.99 per cent for castings made in a cold mold.

Direct Method

Price[4] was probably the first investigator to attempt to measure the gold shrinkage directly, without the use of a pattern. He determined the shrinkage of pure gold to be 2.2 per cent, but this value is more nearly the thermal contraction of the gold from its melting point than a true casting shrinkage. Price concluded that the shrinkage during solidification was of no consequence, since molten gold would be fed constantly into the mold through the ingate until freezing took place.

Coleman[5] determined the shrinkage of several gold alloys as well as that of pure gold. An apparatus was designed so that a cylindrical mold, 3.25 inches in length and 0.12 inch in diameter, could be constructed in dental investment, with the ends formed by plugs of stainless steel which were faced on rods of invar extending beyond the ends of the flask. The linear coefficients of expansion of the equipment were known, and the dimensions of the mold could be determined at all times by measuring the distance between the ends of the projecting invar rods, and subtracting their length. The length of the casting could then be measured, and compared with the length of the mold. Coleman reported a casting shrinkage for gold and gold alloys of 1.25 per cent, a value which appeared to be independent of the temperature of the mold, the temperature of the molten gold and the composition of the alloy. The percentage deviation for this figure was later reported as 0.1 per cent,[6] and it was claimed that the shrinkage was independent of the shape of the casting. This value for different shapes of castings was still later reported to be 1.2 ± 0.2 per cent.[7]

The shrinkage value of 1.25 per cent is less than the thermal shrinkage of the metal from its solidus or melting point. Coleman[5] accounted for this by two assumptions: (1) The friction between the melt and the investment walls prevented the shrinkage during the first stages of freezing and cooling, and (2) molten metal entered the mold after the peripheral areas of the casting had solidified. He further points out, on this basis of reasoning, that the shape of the casting may affect the amount of shrinkage.

Apparatus

The purpose of the present investigation was to construct an apparatus for a more accurate determination of the casting shrinkage of gold and its alloys. Six different designs of equipment were constructed before a suitable apparatus was found. The details of the final apparatus used for obtaining the data presented in the tables are shown in Figures 1 and 2.

In order to obtain maximum accuracy, the apparatus shown in Figure 1 was designed. The Brown and Sharpe micrometer (accuracy 0.0001 inch) was mounted in a frame so that heat from handling would not produce errors owing to thermal changes in dimension. Caps (Fig. 1 [f-f]) were fitted to the spindles of the micrometer. The caps were counter-bored to receive any type of insert

3. Shell, J. S., Gold Castings—with Special Reference to Cast Gold Inlays. *J.A.D.A.* 10:187 (March) 1923.

4. Price, W. A., The Laws Determining the Behavior of Gold in Fusing and Casting. *D. Cosmos* 53:282 (March) 1911.

5. Coleman, R. L., *Physical Properties of Dental Materials.* Research Paper No. 32. Washington: U. S. Government Printing Office, 1928, pp. 908-911.

6. Souder, Wilmer, Fifteen Years of Dental Research. *J.A.D.A.* 21:62 (January) 1934.

7. Souder, W. H., and Paffenbarger, G. C., *Physical Properties of Dental Materials.* National Bureau of Standards, Circular C433, 1942.

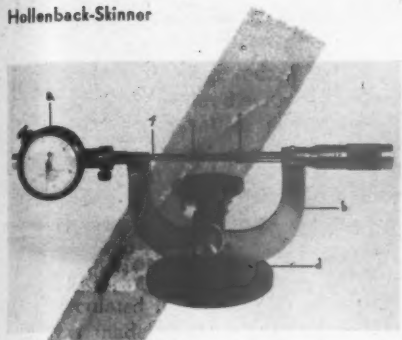

Fig. 1.—Micrometer used for the determination of the casting shrinkage of gold. a. Dial gage. b. Three-inch micrometer (0.0001 in.). c. Frame and adjustable pedestal for supporting micrometer and casting flask (see Fig. 3). e. Two-inch invar test rod. f-f. Caps fitted to spindles of micrometer

which was 12 gage (B. and S.) in diameter. This precaution insured that the object to be measured was always alined accurately between the spindles of the micrometer, provided, of course, that its points of reference were 12-gage rods. The spindle on the stationary end of the micrometer was removed, and it was replaced by an elongated spindle so that it contacted the spindle of a Federal dial gage (0.0005 inch). The dial gage was loaded so that it exerted a counter-pressure against the micrometer spindle of approximately two pounds after its indicator had made one complete turn. This procedure insured that the object to be measured was under a constant, identical pressure whenever it was measured. A 2-inch test rod (Fig. 1 [e]) was constructed of invar, with 12-gage hardened steel inserts at the ends.

In practice, the test rod was placed in position in the counterbored caps, and the micrometer head was set at zero. The dial gage was then adjusted so that the indicator made approximately one complete turn from the zero position. The object to be measured, previously provided with 12-gage reference points in accurate alinement and 2 to 3 inches apart, was placed on the adjustable pedestal (Fig. 1) and raised or lowered until the reference points fitted into the steel caps. The micrometer was set to provide the same setting of the dial gage as for the test rod, and the reading of the micrometer head was added to 2 inches to determine the length of the object.

Experience with various types of casting flasks indicated that the chief errors to be overcome were due to thermal dimensional changes which occurred during the casting of the gold. Consequently, all the parts of the flask which might affect the dimension of the mold were constructed of invar. Furthermore, it was decided to cast the specimens with the mold at room temperature; a water-cooling arrangement was provided to insure that any dimensional change of the flask during casting would be negligible. The plan for the circulation of water is shown in Figure 2A.

The general plan of the flask (Fig. 2A) was to provide a mold, 1 inch in length, in which various sizes of cylindrical specimens could be cast, sur-

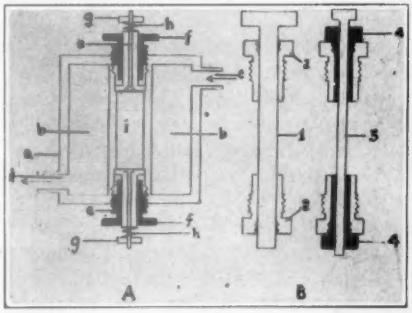

Fig. 2.—(A) Design of casting flask (horizontal section through mold space): a. Body of flask. b-b. Water space. c. Water inlet. d. Water outlet. e-e. End plate assembly, constructed of invar, and held in place with threaded bronze plugs (f-f). g-g. Nuts. h-h. Springs. i. Mold space. (B) Assembly for construction of investment mold: (1) Headed brass pattern rod. (2-2) Hollow plugs, to hold pattern rod; in use, these plugs replace plugs (f-f) in A. (3) Pattern rod of smaller dimension, centered in plugs (2-2) with bushings (4-4)

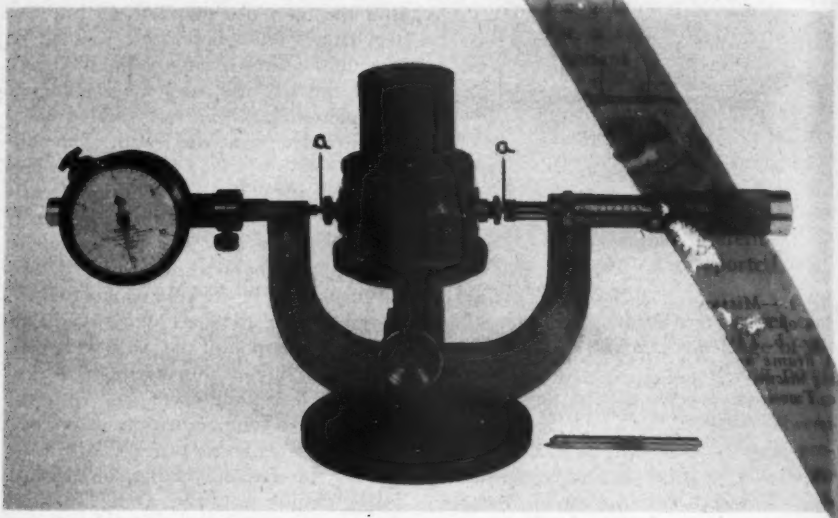

Fig. 3.—Complete flask in position on micrometer pedestal. The ring above the flask proper contains the crucible former and beginning of ingate. a-a. Plunger rod of end plate assembly accurately centered in counterbored caps attached to spindles of micrometer (see Fig. 1)

rounded with dental investment except at the ends, where the mold was closed by end plates made of invar. Each end plate (Fig. 2A [e-e]) was constructed of two parts. A sleeve was provided with a head resting on a shoulder constructed in the invar tube which surrounded the investment-mold space. This sleeve was held in place tightly against the shoulder by a threaded plug (f). A 12-gage invar rod was passed through this sleeve, with a head on the rod resting against a shoulder on the sleeve. The head of the rod was held firmly against the sleeve by a nut (g) and the spring (h). The entire assembly is thus constructed, so that, if any thermal dimensional changes do occur, the error will be negligible.

A ring was fastened to the top of the invar flask, to fit a conventional dental crucible former (Fig. 3).

Technic

The technic finally adopted for investing and casting the rods is as follows: Both end plate assemblies were removed from the flask, and one was replaced by a hollow threaded plug from the pattern rod assembly (Fig. 2B [2]). An investment water-powder ratio of 0.26 was used throughout. The mix of investment was spatulated mechanically under vacuum for ten seconds.

After the flask had been filled with investment, the other hollow plug was screwed in place, and the pattern rod was passed through the investment and the hollow plugs. The top ring was filled with investment, the crucible former was pressed into position, and a sprue pin with a wax reservoir was passed into the investment until it contacted the pattern rod.

After the investment had set, the sprue, pattern bar and hollow plugs were removed. Any undesirable flakes of hardened investment were then removed from the shoulders, and the entire assembly was heated to 450° C. (840° F.) for thirty minutes.

The flask was allowed to cool to room temperature, and the distance between

the ends of the 12-gage rods of the end assemblies was measured with the special micrometer (Fig. 1) as previously described. The original length of the mold was determined as the arithmetical difference between the length of the rods and the reading obtained with the micrometer. The flask was then placed on the casting machine; water (25 ± 1° C.) was circulated through it; and the casting was made under air pressure. The metal was always preheated on a charcoal block, and subsequently was melted in the crucible of the apparatus as rapidly as possible with a gas-oxygen blow torch. A second measurement was then taken to check the original measurement. The nuts (Fig. 2A [g-g]) were then loosened, and the rods in the end plate assembly were pressed firmly inward so as to contact the ends of the casting. The casting shrinkage is obviously the percentage difference between the two readings as compared with the original length of the mold.

General Results

This method for the determination of the casting shrinkage proved to be of greater accuracy than any method heretofore reported in the literature. The data for ten trials for the casting shrinkage of pure gold and 22-carat (dark) gold alloy,* respectively, are given in Table 1. For some unknown reason, two of the trials for the determination with pure gold were definitely out of line, and are, therefore, not included in the final average. The casting shrinkage value of 1.67 per cent finally established is in close agreement with the values obtained by Lane[1] and by Shell.[8]

Table 1.—Casting shrinkage of pure gold and 22-carat (dark) alloy

Specimen Number	Casting Shrinkage	
	Pure Gold (Per Cent)	22-Carat (Dark) (Per Cent)
1	1.61	1.52
2	1.69	1.50
3	1.72	1.52
4	1.56	1.50
5	1.54	1.49
6	1.67	1.50
7	1.66	1.50
8	1.67	1.50
9	1.69	1.51
10	1.67	1.49
11		1.50
Average	1.65 ± 0.05	1.50 ± 0.01
Final average*	1.67 ± 0.02	

*Data for specimens 3 and 4 are omitted from the average.

Table 2.—Miscellaneous determinations of casting shrinkage

Gold Alloy	Casting Shrinkage (Per Cent)
Gold (pure)	1.67 ± 0.02
22-carat (dark)	1.50 ± 0.01
Deetwo	1.56 ± 0.01
Deefour	1.37 ± 0.00
Deesix	1.42 ± 0.01
Deetech ("K" metal)	1.54 ± 0.01

Typical results for a number of commercial alloys and pure gold are presented in Table 2 with their average deviations. In general, the determination of the casting shrinkage can be made with an average deviation of approximately ± 0.01 per cent, or ± 0.02 per cent at the most. Furthermore, it may be concluded from Table 2 that the casting shrinkage varies from one alloy to another, the variation possibly being caused by differences in composition.

Effect of Casting Temperature

All of the specimens of 22-carat (dark) alloy, except numbers 4, 5 and 6, were cast at a temperature slightly above the liquidus temperature of the alloy. In order to determine the effect of the temperature of the gold alloy on the casting shrinkage, specimens 4 and 5 were cast with the temperature of the melt at 1260° C. (2300° F.). As can be observed (Table 1, third column), no difference in casting shrinkage occurred. The metal

*Approximate composition: gold, 91.66; silver, 4.17; copper, 4.17.

used for specimen 6 was heated to a brilliant white heat (1300°-1350° C.) before casting. Again, no significant difference was observed (Table 1). The fact that the casting temperature exhibits no effect on the casting shrinkage is in agreement with the results of Coleman.[5]

Effect of Dental Investment

Three different commercial dental investments were used to cast the eleven specimens of 22-carat (dark) gold used to obtain the data in the third column of Table 1. A water-powder ratio of 0.26 was used in all cases. Specimens 1 to 6, inclusive, were cast with "Beautycast" investment (Whip-Mix Corporation), specimens 7 and 8 with "Security" investment (Cleveland Dental Mfg. Co.), and specimens 9-11, inclusive, with "Gray" investment (Ransom and Randolph Company). Apparently these investments do not affect the casting shrinkage, although it is conceivable, according to the theory of Coleman,[5] that the roughness of the investment mold walls might exhibit an effect on the casting shrinkage by virtue of a rough surface which might increase the frictional retention of the molten metal during solidification. It possibly may be assumed that the smoothness of the mold surface is related to the fineness of the investment, and that any investment which meets the requirements for fineness given in the American Dental Association Specification No. 2 for Dental Inlay Casting Investments will not affect the casting shrinkage.

Effect of Composition

The effect of the composition of the alloy was studied by replacing the gold content of an alloy with platinum or palladium in increments of 3 atomic per cent. The compositions and the casting shrinkages of the alloys are given in Table 3. The atomic percentage composition of the original alloy, before the addition of the platinum or palladium, was: gold, 58.5; silver, 13.7; copper, 25.6; and zinc, 2.2 (weight per cent: gold, 78.0; silver, 10.0; copper, 11.0; and zinc, 1.0). Since the palladium and platinum were added to replace the gold, the atomic percentages of the other metals remained unchanged throughout, and only the composition in terms of gold, palladium and platinum is reproduced in Table 3.

Table 3.—Effect of platinum and palladium on the casting shrinkage of gold alloys

Alloy Number	Composition (Atomic Per Cent)			Linear Casting Shrinkage (Per Cent)
	Gold	Palladium	Platinum	
1	58.5	0.0	.....	1.50±0.01
2	55.5	3.0	.....	1.46±0.03
3	52.5	6.0	.....	1.48±0.01
4	49.5	9.0	.....	1.41±0.02
5	46.5	12.0	.....	1.45±0.01
6	43.5	15.0	.....	1.44±0.01
7	55.5	.....	3.0	1.38±0.01
8	52.5	.....	6.0	1.34±0.02
9	49.5	.....	9.0	1.33±0.02
10	46.5	.....	12.0	1.32±0.01
11	43.5	.....	15.0	1.30±0.01

Inspection of Figure 4 and the data in Table 3 indicates that both platinum and palladium lower the casting shrinkage when they are added to the original gold alloy. Platinum is evidently more effective than palladium in this regard. Furthermore, small amounts of either element are very effective in lowering the casting shrinkage, since additions greater

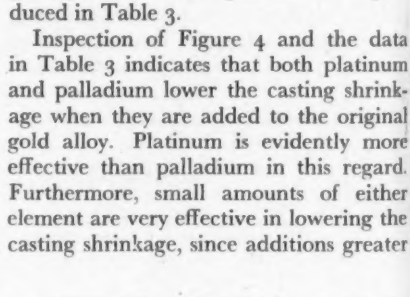

Fig. 4.—Effect on the casting shrinkage of the addition of platinum and palladium to a gold alloy

than 3 atomic per cent of either element failed to affect the shrinkage to any considerable extent.

More research needs to be carried on in this connection before any theory can be advanced as to the cause of this phenomenon. The effects of the other metals should be studied as well. The present data indicate that this effect possibly may be related in some manner to the solidification range of the alloy. On the basis of Coleman's theory,[5] for example, a greater interlocking between the walls of the mold and the melt might be expected with a large solidification range, and conversely. On this basis, the larger solidification range would tend to reduce the casting shrinkage.

Size and Shape of Specimens

According to the theory of Coleman, the size and shape of the casting might affect the casting shrinkage, since the frictional attachment of the metal to the walls of the mold during solidification might vary with the area of the mold surface. All castings discussed thus far were rods, 1 inch in length and 0.22 inch in diameter. The 22-carat (dark) alloy was cast into molds 1 inch in length and 0.125 inch and 0.144 inch in diameter. Unfortunately, the data are somewhat inadequate in that the apparatus was not designed to operate with as complete success with the smaller bars, the diameter of which approached that of the head of the measuring rods. As a result, considerable difficulty was experienced with fin formation and other irregularities. Nevertheless, the data for this experiment, presented in Table 4, are of interest. Specimens 1 to 8, inclusive, were 0.125 inch in diameter and 1 inch in length, and 9 to 16, inclusive, were 0.144 inch in diameter and 1 inch in length. As may be observed, no significant difference was noted in the casting shrinkage of the two different sized specimens.

Table 4.—Effect of size and shape of specimen on the casting shrinkage of gold alloys

Specimen Number	Casting Shrinkage (Per Cent)	Character of Specimen
1.....	1.49	Rough, small fin on one end
2.....	1.40	Smooth, large fin on one end
3.....	1.48	Rough, fin on one end
4.....	1.40	Large fins on both ends
5.....	1.48	Fin on one end
6.....	1.50	Smooth, no fins
7.....	1.45	Smooth, small fins on both ends
8.....	1.42	Rough, large fins on both ends
9.....	1.51	Smooth, no fins
10.....	1.45	Smooth, large fin on one end, small fin on other end
11..	1.50	Smooth, no fins
12.....	1.47	Smooth, large fin on one end
13.....	1.49	Smooth, small fin
14.....	1.44	Smooth, small fins on both ends
15.....	1.39	Smooth, large fins on both ends
16.....	1.44	Rough, small fins on both ends
17.....	1.46	Dumb-bell shape (Fig. 5 [1])
18.....	1.29	Dumb-bell shape (Fig. 5 [2])
19.....	1.38	Dumb-bell shape (Fig. 5 [3])
20.....	1.31	Cylinder covered with spines (Fig. 5 [4])

According to Table 1, the casting shrinkage for this alloy as previously determined on the larger rods is 1.50 ± 0.01 per cent. According to Table 4, this shrinkage was obtained in every case within the experimental error when no fins or very small fins appeared on the casting. Apparently the fins caused a "stretching" of the alloy during cooling and thus reduced the shrinkage. Indirect evidence of the effect of the shape of the casting on the shrinkage may be deduced from the fact that the presence of fins on the larger rods (Fig. 6) failed to affect the shrinkage. It can be deduced, there-

Fig. 5.—Four specimens of special shapes. (1) Shaft diameter, 0.216 in.; diameter of heads, 0.315 in.; length of heads, approximately 0.12 in. (2) Shaft diameter, 0.145 in.; diameter of heads, 0.203 in.; length of heads, approximately 0.12 in. (3) Shaft diameter, 0.145 in.; diameter of heads, 0.182 in.; length of heads, approximately 0.24 in. (4) Diameter, 0.145 in.; length of lateral rods, approximately 0.07 in.

fore, that the effect of the reduced mold surface area in the smaller castings, in addition to the "stretching" effect of the fins, reduced the casting shrinkage. The reduced mold area in itself, however, appears to have no effect on the casting shrinkage. Such a conclusion leads one to speculate as to the effect of irregular portions in small inlay castings on their casting shrinkage. Admittedly, more investigation needs to be carried on in this connection before final conclusions can be drawn.

In order to test this point further, patterns were constructed in dumb-bell shapes (Fig. 5). As predicted by the theory outlined above, the casting shrinkages for these castings (Table 4, specimens 17-19, inclusive) were smaller than for the test bars. Specimen 4 in Figure 5 also showed a lower casting shrinkage (Table 4, specimen 20) for the same reason.

Occasionally castings were found to be defective. All of these castings are pictured in Figure 6. Only one of these castings (sixth from the right in the photograph) exhibited a shrinkage different from the values obtained from sound castings. This fact is significant in giving further proof for the effect described for the fins. Gross irregularities in shape do not affect the casting shrinkage of the size of bars used in this research.

Summary and Conclusions

An apparatus has been designed to measure with precision the casting shrinkage of gold and its alloys. Cylindrical bars, 1 inch in length and 0.22 inch in diameter, were cast in a previously measured mold formed by dental investment. The length of the casting was measured without its removal from the mold. According to the methods and data presented, the following conclusions can be stated:

1. The casting shrinkage of pure gold was determined as 1.67 ± 0.02 per cent.
2. The temperature of the melt had no effect on the casting shrinkage.
3. Molds made from three different commercial dental investments failed to affect the casting shrinkage.
4. The composition of the alloy affected the casting shrinkage, in that both platinum and palladium reduced it.
5. The diameter of the bar had no apparent effect on the casting shrinkage, but sharp discontinuities toward the ends of the smaller castings reduced the casting shrinkage. However, the data on which this conclusion is based are questionable, owing to the inadequacy of the apparatus.

Clinical Significance

The clinical significance of the values determined herewith for the casting shrinkage of gold and its alloys is not entirely clear. It can be claimed that the bars used by us (1 inch in length and 0.22 inch in diameter) more nearly approximate the size of an operative restoration of cast gold than did the bars used by Coleman[5] (3.25 inches in length and 0.12 inch in diameter). It is conceivable that the value of the casting shrinkage

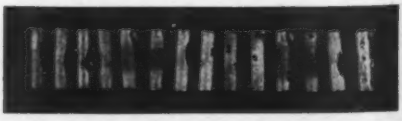

Fig. 6.—Defective castings

given by Coleman (1.25 per cent) is lower than our results because of the extreme length and comparatively small diameter of the bar used by him. We were not able to vary the dimensions of the bars sufficiently to test this hypothesis.

According to our results, any sharp discontinuities in the shape of the pattern may affect the casting shrinkage. It is conjectural how much the casting shrinkage of a gold inlay will be affected by sharp angles and "feather" edges. On the other hand, these effects are probably not great, as evidenced by the fact that most of the castings shown in Figure 6 exhibited normal casting shrinkages in spite of the nodules and concavities. However, it may be concluded that defective castings with fins will not fit as well as smooth castings.

The differences in casting shrinkages according to composition are clinically significant, provided modern precision technics are used.[8] As the casting technics become generally more accurate, it will be necessary for the manufacturers to publish the values for the casting shrinkage of their alloys along with the data for other properties.—*311 East Chicago Avenue.*

8. Hollenback, G. M., Precision Gold Inlays Made by a Simple Technic. *J.A.D.A.* 30:99 (January 1) 1943.

PAIN AND ITS SIGNIFICANCE IN ORAL SURGERY

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As SCIENCE strives to understand the truth underlying any given field, the simpler and more understandable the science of that field becomes. In medicine, however, the reverse sometimes appears to be true. Thus, we have the neurologist who traces pain having a physical inception, and the psychiatrist who deals with pain whose origin is in the patient's mind.

Patients usually seek counsel because of symptoms which they cannot control or understand. Pain, being the most devastating symptom, is the most common complaint. A single specific symptom is usually not peculiar to any one disease, but often appears in several similar diseases or conditions. Because pain may be the only symptom manifested, the clinician is compelled to make objective findings from subjective symptoms. It is the search for the causes of pain that makes for successful clinical diagnosis. Cornelius Celsus,[1] in 34 A.D., announced the four signs of inflammation: pain, heat, redness and swelling. Of late years, a fifth sign has been suggested: impairment of function.

Thus, when a patient presents only one of the five symptoms mentioned, we must question him carefully regarding that specific complaint. There are many direct diagnostic questions that can be asked. They may seem unnecessary and inconsequential to the patient but to the clinician, no question is superfluous if it enables him to arrive at a correct diagnosis. If a patient with a full complement of teeth comes to the dentist com-

1. Encyclopedia Britannica. 12:342.

plaining of pain, the dentist may logically suspect any one of thirty-two teeth to be the offender. If the same patient complains to his physician of pain in the abdomen, the physician may suspect any one of about the same number of conditions or diseases. We will concentrate our concern upon the teeth and their adjacent structures.

Pain Related to the Teeth

Dental pulp pain is intermittent in early pulp involvement without exposure of the pulp. In active and passive hyperemia, pain lasts from thirty seconds to two or more minutes. In partial pulpitis, pain may last for many minutes. In total pulpitis the pain lasts from thirty minutes to an hour with discomfort between paroxysms. In these cases the pulp will often die from strangulation. Pulp exposure will cause a dull throbbing pain which is usually constant. When the inflammation reaches the apex of the root the tooth will be sore to percussion. In spontaneous death of dental pulp, pain is often referred to remote areas and it is often more severe at night. In these cases it may be difficult to locate the offender. This pain is increased by heat and relieved by cold. Later, when this tooth becomes sensitive to pressure, the diagnosis is a simple problem. Pericemental pain is constant in degree depending on the amount of membrane involved. Such a tooth is also tender to percussion. In so-called "pyorrhea," the pain is dull in character and often associated with sensitivity of the necks of the teeth involved.

In cases of acute periapical infection the pain is usually severe, the tooth is sore to percussion, and may seem elongated to the patient. There may be tenderness on pressure along its root end. As the condition progresses, other signs of inflammation are demonstrable.

It is sometimes difficult to ascertain if the offending tooth is in the upper or lower arch. The patient knows only that the pain is on one or the other side of the face. Rarely, if ever, is the pain referred to the opposite side of the face. If the pain is referred to the ear or to the angle of the jaw, it is usually a lower tooth. If the pain is referred to the back of the head, an upper tooth should be suspected.

Postextraction pain is not too difficult to understand and subsidence usually occurs in due course of time. If extraction pain increases, however, and becomes so severe that the common sedatives have no effect, a so-called "dry socket" should be suspected. This localized osteitis is best treated with local medicated socket dressings. The sulfonamides are of little value in relieving dry socket pain. If the pain does not subside and a fever develops, an infection should be suspected. The most severe pain occurs in early osteomyelitis, where all signs and symptoms of an infection are present. Morphine, even in large doses, has little if any effect in relieving pain in early osteomyelitis of the mandible, a very significant diagnostic point.[2]

As regards unerupted or impacted teeth in adults, it is a known fact that impacted molar teeth which lie inclined toward or horizontal to their immediate fellows, do cause pain. This pain is usually not severe if no infection is present. It is usually nondescript and may be associated with that of pressure; and, may I repeat, in the lower arch the pain may be referred to the ear.

If an impacted or unerupted third molar is free from caries and the pain is local, severe and continuous, with some immobility, an infection of the soft tissues around the tooth should always be suspected. The unerupted third molar in such cases is only indirectly the cause of such pain. The local infection, in which

2. Penhale, K. W.: Early Diagnosis and Treatment of Osteomyelitis of the Mandible. J.A.D.A. 28:288, February 1931.

all signs and symptoms of inflammation will be present, should be treated first for the relief of pain rather than by extraction of the tooth. Brookes[3] states that pain in inflammation is due to the tension in the tissues produced by the exudate and the trauma, causing pressure and irritation of the nerve endings. If a local abscess develops, clinical signs referable to such a condition will also be present, but the pain is often less severe when the condition has fully developed.

Third Molar

Often patients, knowing that they have an impacted "wisdom" tooth in the lower jaw, attribute to it most occurrences of pain in that vicinity. As stated, impacted wisdom teeth or third molars, as such, rarely give true, continuous or throbbing pain. Patients do complain of a "pressure sensation" interpreted as pain which is often referred to the ear. A differential diagnosis should always be made in these cases between the pain of inflammation around an unerupted third molar, pressure pain due to the location of the third molar, pain due to dental caries, and pain due to a dying pulp or periapical infection. Too often it has been found, after extraction of the unerupted third molar, that the cause of pain was a pathologic condition, or even caries, in a tooth anterior to the one removed.

Unerupted cuspids are quite common, but pain referable to them is quite uncommon. A patient who gives a history of vague, intermittent pain in the vicinity of such a tooth should not, however, be called psychoneurotic. Unerupted cuspids in the upper arch, when lying in contact with another tooth, have been a cause of headaches which may be relieved after such teeth are removed. Impacted cuspids have no bearing on migraine headaches.

3. Henry, Jr., S. B.: A Textbook of Surgical Nursing. St. Louis: C. V. Mosby Co., 1937, p. 22.

Teeth in which there are pulp stones may or may not cause pain. If and when they do, the pain is sharp, continuous, lancinating[4] and referred centrally. Heat and cold have little if any effect. Tenderness on percussion and response to an electric stimulation may be the only diagnostic aids. Removal of the tooth is the treatment of choice.

Pain Resulting from Tumors

Bone cysts of dental origin usually lie dormant and rarely produce pain unless they become infected. If infection occurs, the pain is usually local, accompanied by other signs and symptoms of an infection.

Congenital cysts in the region of the anterior palatine foramen are rare. They are sometimes called naso-palatine, or midline cysts,[5] owing to their location. Patients are usually quite positive regarding complaints of pain in this region. If the cysts are small, roentgenologic findings simulate the anterior palatine foramen, making the diagnosis most difficult.

Pain Connected with the Sinuses

Affections of the maxillary sinuses are not uncommon.[6] Patients so afflicted may seek dental counsel, as early pain may occasionally be localized about the apices of the upper molar teeth. Pulp tests and roentgenograms render little if any diagnostic aid. Transillumination of the maxillary sinuses may reveal some evidence of cloudiness. In these cases, where there are no positive indications for the extraction of teeth, the procedure should always be avoided. Often the pain referred to the teeth subsides after twenty-four or

4. Glaser, M. A.: Facial Neuralgia in Relation to Dentistry. J.A.D.A. 19:1537, September 1932.

5. Meyer, A. W.: Unique Supernumerary Para-Nasal Sinus Directly Above Superior Incisors in Spolia Anatomica. J. Anat. and Physiol. 48:118, January 1914.

6. Hall, S. S., and Thomas, H. V.: Sinusitis and Its Complications with a Few Related Dental Problems. West Virginia M. J. 30: 550, December 1934.

forty-eight hours, when positive symptoms of suppurative maxillary sinusitis may be noted by a purulent nasal discharge. If the patient has fullness and pressure beneath the orbit, with agonizing pain involving the entire side of the face, acute maxillary sinusitis is usually the cause.

When the frontal, ethmoidal and sphenoidal sinuses become inflamed, headache may be the early subjective symptom. This pain is usually referred to the forehead, orbit and bridge of the nose, and is most severe during the morning hours.

Pain Manifesting in the Tongue

The tongue also is subject to inflammatory changes and painful responses. Beneath the tip of the tongue and on either side of its frenum lies a small papilla, the opening of Wharton's duct which leads to the submaxillary gland. Infections or obstructions by calcified bodies of various sizes may occur in either the duct or gland. If these concretions partially block the flow of saliva, the patient is usually aware of pain or swelling which becomes more severe during mastication. Pain increases with salivary pressure, the symptoms becoming more pronounced as time elapses.

Burning tongue (Moeller's glossitis) is not an uncommon complaint. In these cases the tongue is smooth and shiny as if devoid of epithelium. Pernicious anemia should be ruled out by careful blood examination. In all cases one should search for inflammatory changes or new growths.

Glossodynia, or pain in a tongue that looks normal, often presents a very difficult problem to diagnose and frequently is not diagnosed correctly. Patients with the complaint of "burning tongue" are usually women of middle age. These women often have cancerphobia but do not become symptom free after assurance that no cancer is present. Neurologists, recognizing this common attitude, have recommended psychotherapy. Costen,[7] who examined ninety cases of pathologic conditions of the mandibular joint, found ten cases of burning tongue. He believes by assumption that the pain in the tongue is produced reflexly by pressure of the condyle on the auriculotemporal nerve with reference of the pain along the lingual nerve. Repositioning the lower jaw by changing the vertical dimension and moving the condyle away from the range of the chorda tympani and auriculotemporal nerves gives moderate relief in some cases. However, more positive results from this procedure are claimed by Costen. But as Chor[8] has stated, "Although explanations may appear attractive and at first glance a proposed hypothesis may sound logical, definite proof should be presented before conclusions can be accepted as factual." In these cases of burning tongue, one should always remove all sharp edges of teeth, overhanging fillings and ill-fitting crowns.

In general, inflammatory processes at the tip of the tongue cause pain which radiates to the mental region, while those on the lateral sides cause pain which radiates to the hyoid region. Inflammatory processes back of the tip of the tongue cause pain which is referred to the occipital region and back of the ear.

Pain Resulting from Duct and Gland Stones

Calcified nodules do occur in the parotid gland, but rarely are they found in Stensen's duct. Stones in this gland are rare in comparison with their incidence in the submaxillary gland. In cases of parotid gland stones, pain is very severe

7. Costen, J. B.: Glossodynia: Reflex Irritation from the Mandibular Joint as the Principal Etiologic Factor. Arch. Otolaryng. 22: 554, November 1935.

8. Chor, Herman: Neurologic Aspects of Temporomandibular Disorders. J.A.D.A. 25: 1033, July 1938.

and becomes increasingly so as the swelling increases, which is usually associated with eating. Nonspecific suppurative infections of the parotid gland are more common but less painful. Pain from such parotid swellings is aggravated by heat and relieved to some extent by cold. Slow growing mixed tumors of the parotid gland are usually not painful during their early development.

Pain Referred to the Joints

Today the temporomandibular joint is receiving increasing attention as one of the many sources of pain about the face.[9] Costen,[10] in 1934, called attention to a group of symptoms which occur commonly in disturbances of the temporomandibular joint: "headache, neuralgia, ear symptoms and burning tongue." The explanations given by Costen are:

1. "An erosion of the bone of the glenoid or mandibular fossa and impaction of the condyles against the thin bone separating them from the dura.

2. "Irritation of the auriculotemporal nerve.

3. "The production of a reflex pain and sensory disturbance in the various connections of the chorda tympani nerve, the condyle irritating it where it emerges from the tympanic plate."

One of the most valuable diagnostic signs of a pathologic condition in this joint is local pain that is usually manifested when one applies external pressure directly over the head of the condyle, especially when it is in motion. Treatment varies according to the cause of the complaint.

Occasionally a patient will complain of pain in one or both condyle joints and stiffness of the jaw. According to Bayles and Russell,[11] who examined one hundred consecutive cases of rheumatoid arthritis, 51 per cent had an involvement of the temporomandibular joint. Conservative treatment is first indicated. Physiologic rest, as well as dry or moist heat, together with the general treatment for arthritis usually leads to the relief of pain in these cases. Other workers claim that the temporomandibular joint is free from arthritic changes in infectious arthritis.

Pain Associated with the Nerves

A patient often complains of neuralgia. Neuralgia is a characteristic type of pain. A patient so afflicted will report sharp, excruciating pains that may start at any time, but last only a few minutes, usually seconds. We are all acquainted with the trigeminal syndrome described by André[12] in 1756, and with the glossopharyngeal neuralgia described by Sicard and Robineau[13] in 1920. A third type, posterior occipital neuralgia, although uncommon, merits discussion.

In order to arrive at a diagnosis of these neuralgias, one must be able to demonstrate a trigger zone, which when touched, regardless of how lightly, produces a paroxysm of pain. In early cases the trigger zone is not so positive, and is often difficult to locate. In such cases, patients are usually insistent that a tooth is the contributing cause and often request or even demand its removal. Often many teeth are removed before the patient or the doctor concludes that a change in the treatment is advisable. Trichlorethylene, thiamin chloride and

9. Schultz, L. W.: A Treatment for Subluxation of the Temporomandibular Joint. J.A.M.A. 109:1032, September 25, 1937.

10. Costen, J. B.: A Syndrome of Ear and Sinus Symptoms Dependent upon Disturbed Function of the Temporomandibular Joint. Ann. Otol., Rhin. & Laryng. 43:1, March 1934.

11. Bayles, T. B., and Russell, L. A.: The Temporomandibular Joint in Rheumatoid Arthritis. J.A.M.A. 116:2842, June 28, 1941.

12. André, N., cited by Krause, F.: Die Neuralgie des Trigemines nebst der anatomic und Physiologic den Nerven. Leipzig: F. C. W. Vogel, 1896.

13. Sicard, R., and Robineau: Algie velopharyngel essentielle. Traitment chirurgical. Rev. Neurol. 36:256, 1920.

alcohol are employed as temporary measures only. In my experience, trichlorethylene has little effect, if any. Thiamin chloride, injected intravenously or intramuscularly in large doses, seems to help many, but cures none, especially in severe cases where the paroxysms of pain are most devastating. Thiamin by mouth has but little value. Alcohol, 70 per cent or 90 per cent, injected in or around the nerve sheath at the mental or infraorbital foramen or at the foramen ovale or rotundum, as the case may be, usually gives relief of pain for months and sometimes years (Fig. 1). After repeated injections, even alcohol may give no relief from pain.

If the third division of the fifth nerve is affected, and the pain can be induced by touching "the trigger," a mandibular injection of procaine will give relief for an hour or more. This injection has definite diagnostic value in arriving at a positive diagnosis. Alcohol should not be used in this location, owing to the possibility of trismus that often follows.

Occasionally one encounters a trigeminal neuralgia of the lingual branch which supplies the tongue. The trigger zone, so pathognomonic in trigeminal neuralgia, is definite, but on the side of the tongue. The pain radiates so quickly to the other branches that the diagnosis is usually deceiving on early examination. In many such cases that have come under my observation, all have had relief for at least a year either by the injection of a few minims of alcohol into the nerve sheath or by the cutting of the nerve before it reaches the tongue. By either of these methods the branch to the lip is not affected.

Avulsion of the sensory root of the gasserian ganglion offers the only permanent relief for trigeminal neuralgia patients. The patients should be so informed and prepared for this eventuality after one or more recurrences have followed relief from alcoholic injections.

Glossopharyngeal neuralgia compares

Fig. 1.—Left: Facial expression of a patient suffering from trigeminal neuralgia. Right: Same patient seven days later. The pain was relieved by the injection of alcohol. Note gain in weight

clinically with trigeminal neuralgia but in the former the pain follows the distribution of the ninth nerve. The pain is sharp, shooting and paroxysmal; it does not spread over the face but extends from the tonsillar region into the ear. This pain is usually brought on by drinking cold or hot liquids. The trigger area is in the tonsillar region. In treatment, alcohol is of little value, as it is difficult to inject into the intracranial portion of the nerve. Avulsion of that peripheral nerve gives only temporary relief according to Craig.[14] Intracranial section of the ninth or glossopharyngeal nerve is the only treatment which will give permanent relief.

Posterior occipital neuralgia is much less common in occurrence than the trigeminal neuralgias. The pain in these cases is quite severe at times with intermittent paroxysms. The pain radiates upward and backward simulating unilateral headaches. Teeth, tonsils and sinuses are often suspected as contributing causes, especially upper impacted third molars, if one is present on the side affected. Relief is obtained by avulsion of the occipital nerve in the posterior

14. Craig, W. M.: Diagnosis and Treatment of Pain About the Face and Head. J. M. A. Alabama 6:296, March 1937.

occipital region lateral to the midline of the neck.

Pain Caused by Local and Systemic Diseases

Local and systemic diseases, such as pellagra, scurvy and Vincent's infection, cause painful inflammation or ulceration of the mucous membrane of the mouth. Certain blood diseases[15] such as acute leukemia, aleukemic leukemia, aplastic anemia, granulocytopenia and infectious mononucleosis are peculiarly apt to be complicated by Vincent's infection. Aphthous ulcers, commonly known as canker sores, may be minute in size but extremely painful to the patient. Tuberculous ulcers, although rare, are extremely painful irregular patches on the tongue or cheek. Leukoplakia, as such, does not cause pain.

Early luetic and carcinomatous ulcers rarely cause pain and are often overlooked by the patient. Adjacent lymph glands enlarge early in luetic lesions and are very painful to palpation, while those from carcinoma enlarge late and are usually not painful. Other less common ulcers have other signs and symptoms referable to a systemic complaint best diagnosed and treated by an internist and dermatologist.

Summary

The basic causes of pain are mechanical, chemical and irritant; the last cause may include bacterial toxins.

The factors which modify pain are mental states, individual differences, occupational neuroses, physical states, digestion, motions, etc., drugs and "the weather." Although there is no real explanation for the effect of this last factor, it is thought that low barometric pressure causes greater dehydration of the body with greater tension in the inflamed part, causing greater pain. Some persons develop headaches prior to bad weather, and it is claimed that the paroxysms of trigeminal neuralgia and arthritis become more frequent and often more severe during inclement weather.

The following questions have definite diagnostic value in oral surgery. However, since there is no absolute diagnosis for real pain or for the malingerer, one should ascertain, during questioning, if the patient has a neurotic temperament.

1. Is the pain sharp, dull or throbbing?
2. How severe is it?
3. What relieves it?
4. Is the pain constant?
5. Is the pain intermittent?
6. What starts the pain?
7. Does heat or cold start the pain?
8. What aggravates the pain?
9. Has the patient taken drugs for the pain?
10. What drugs relieve it?
11. Is the pain deep or superficial?
12. Is the pain localized or diffuse?
13. Does the pain start in one location and refer to another?
14. Does pressure have any effect on the pain? (Referred pain is usually relieved by pressure. Localized pain is not.)
15. How long does the pain last?
16. Does the pain occur at any specific time of the day?
17. How frequently does the pain return?
18. Is there local tenderness or soreness on mobility?
19. Has the patient had previous similar attacks of pain and when?

Signs which may or may not be present to demonstrate objective pain are:

1. Facial expression.
2. Increased heart and pulse rate.
3. Increased respiratory rate.
4. Dilated pupils.
5. Perspiration.
6. Nausea and vomiting.

15. Field, Jr., H.: The Therapy of Fusospirochetosis (Vincent's Disease). J.A.M.A. 115:1406, March 23, 1940.

7. Muscular rigidity.
8. Paleness of the skin.

As was stated by John Hilton,[16] "Every pain has its distinct pregnant significance, if we will but carefully search for it." In general, to analyze a patient's complaint, which is usually pain, a careful differential diagnosis should always be made in order to arrive at a correct diagnosis.—*55 East Washington Street.*

16. Mayo, C. H.: The Influence of Pain and Mortality on Modern Medical Practice. Milwaukee Proceedings of the Interstate Postgraduate Medical Assembly of North America. 1931, p. 245.

TIME REQUIRED TO TREAT DENTAL DEFECTS IN 71,015 NAVAL PERSONNEL, WITH REGIONAL AND AGE VARIATIONS

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In a previous report[1] general regional and age differences were found among persons with dental defects. These studies were conducted on 71,015 naval personnel examined in 1942, and the defects considered were simple cavities, compound cavities, simple restorations, compound restorations, teeth missing and teeth to be extracted. In the compilation of the number of dental defects, each person with a given defect was counted as one, without regard for the number of each type of defect per person.

The purpose of this report is to determine the number of certain dental defects in the same 71,015 naval personnel on first examination in 1942, and the influences of region of birth and age. Similar studies had been previously made on military personnel who had passed dental entrance requirements,[2, 3] using cumulative scores to represent the dental status of these persons. These scores do not indicate the number or type of defect, and consequently do not lend themselves readily to computations on time required by dental officers to render necessary dental treatment.

Another aim of this present study is to compare the estimated time required to render appropriate dental treatment to naval personnel born in different regions. By comparison of the estimated time expended on dental treatment already present in persons, and the time required to render dental treatment estimated to be necessary, the relative dental attention in the various regions was appraised. Similar studies comparing dental care received and that required, using different criteria, have been undertaken. Among these studies were those on 1,438,318 children 6 to 14 years of age[4] in

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The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

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1. Schlack, C. A., and Restarski, J. S., *Dental Status of 71,015 Naval Personnel at First Examination in 1942. Age and Regional Distribution of Persons with Specific Type Dental Defects.* Research Project X-131, Report No. 2, Naval Medical Research Institute, January 11, 1946.

2. Senn, W. W., Incidence of Dental Caries Among Aviation Cadets. *Mil. Surgeon* 93:461 (December) 1943.

3. Ferguson, R. A., Some Observations on Diet and Dental Disease. *J.A.D.A.* 22:392 (March) 1935.

4. Messner, C. T.; Gafafer, W. M.; Cady, F. C.; and Dean, T. H., *Dental Survey of School Children, Ages 6-14 Years, Made in 1933-34 in 26 States.* Washington: Government Printing Office, 1936.

States contained in each region and abbreviations used for each region

twenty-six states, on 1,800 high school children from 13 to 19 years of age in six communities in Maryland,[5] on 200,000 children 6 to 14 years of age in forty urban communities in New Jersey,[6] and on 66,463 persons of all ages in Detroit.[7] These investigations revealed that dental treatment needed was generally greater than that already rendered in most regions. However, no definite indices had been calculated for appraisal of dental attention by region in these reports.

Procedure

The data on which the present report is based were gathered on a group of 71,015 naval personnel in a manner previously described.[1, 8] In this report the data on dental defects are arranged by region of birth and age groups; the states contained in each region and the abbreviations used for each region are shown in the accompanying map. The age and regional distributions of the populations are shown in Tables 1 and 2. The dental defects presented by the regional and age distributions are: simple and compound cavities, simple and compound restorations, teeth missing and teeth to be extracted.

By application of a correction factor of 2.75 (examining error)[8] to the number of simple and compound cavities reported per person, a more accurate estimate of the number of cavities to be treated was made. Since it was previously estimated that 0.00406 dentist years were required to treat 10.13 cavities estimated to be present per person, in addition to other necessary dental treatment procedures,[8] it was possible to calculate the mean number of dental officer man years necessary to treat the dental defects in each region. By the same method the number of dentist years already spent in treating dental defects in each region was calculated. The ratio of dental work required to dental work expended by region was determined, and this ratio

5. Klein, Henry, and Palmer, C. E., Prevalence and Incidence of Dental Caries Experience, Dental Care and Carious Defects Requiring Treatment in High School Children. *Pub. Health Rep.* 55:1258 (July 12) 1940.

6. Klein, Henry, and Palmer, C. E., Community Economic Status and the Dental Problem of School Children. *Pub. Health Rep.* 55:187 (February 2) 1940.

7. Britten, A. H., A Study of Dental Care in Detroit, Michigan. *Pub. Health Rep.* 53:446 (March 28) 1938.

8. Restarski, J. S.; Schlack, C. A.; and Dochterman, E. F., *Dental Status of 71,015 Naval Personnel at First Examination in 1942.* Research Project X-131, Report No. 1, Naval Medical Research Institute, November 26, 1945.

Table 1.—Distribution of naval personnel examined in 1942, by age group and region of birth

Region of Birth	All Ages	Age (Years)						
		17-19	20-24	25-29	30-34	35-39	40-44	45 and Over
All regions	71,015	18,649	29,477	9,893	6,961	3,792	1,625	618
Continental United States	69,584	18,542	29,002	9,697	6,683	3,557	1,539	564
Abroad	1,431	107	475	196	278	235	86	54
Continental United States:								
New England	6,014	1,545	2,603	862	528	278	134	64
Middle Atlantic	12,972	3,183	5,941	1,718	1,130	609	277	114
East North Central	7,474	1,673	2,762	1,253	906	551	251	78
West North Central	6,502	1,182	2,497	1,200	838	508	197	80
South Atlantic	11,116	3,718	4,610	1,284	856	407	183	58
East South Central	5,747	1,722	2,421	676	498	265	114	51
West South Central	10,332	2,814	4,024	1,486	1,133	565	231	79
Mountain	3,672	904	1,697	508	337	150	57	19
Pacific	5,755	1,801	2,447	710	457	224	95	21

constituted an index of the dental care in these regions.

Distribution of Dental Defects

The dental defects in naval personnel were distributed in such a manner that a small percentage of the persons tended to have most of the defects (Table 3). For this reason the average (arithmetic mean) (Table 4) does not represent the number of defects in the typical person. The mean number of simple cavities reported per person was found to be 2.9 for all ages and regions (Table 4); the median was 1.2 (Table 6), indicating that 50 per cent of all the persons examined had 1.2 simple cavities or less. Both the means and the medians for

Table 2.—Percentage distribution of naval personnel examined in 1942, by age group and region of birth

Region of Birth	All Ages	Age (Years)						
		17-19	20-24	25-29	30-34	35-39	40-44	45 and Over
All regions	100.00	26.26	41.51	13.93	9.80	5.34	2.29	0.87
Continental United States	100.00	26.65	41.68	13.94	9.61	5.11	2.21	0.80
Abroad	100.00	7.48	33.19	13.70	19.43	16.42	6.01	3.77
Continental United States:								
New England	100.00	25.69	43.28	14.34	8.78	4.62	2.23	1.06
Middle Atlantic	100.00	25.54	45.80	13.24	8.71	4.69	2.14	0.82
East North Central	100.00	22.38	36.97	16.76	12.12	7.37	3.36	1.04
West North Central	100.00	18.18	38.40	18.46	12.89	7.81	3.03	1.23
South Atlantic	100.00	33.45	41.47	11.55	7.70	3.66	1.65	0.52
East South Central	100.00	29.96	42.13	11.76	8.67	4.61	1.98	0.89
West South Central	100.00	27.23	38.95	14.38	10.96	5.47	2.24	0.77
Mountain	100.00	24.62	46.21	13.83	9.18	4.09	1.55	0.52
Pacific	100.00	31.29	42.52	12.34	7.94	3.89	1.65	0.37

Table 3.—Observed percentage of persons with varying numbers of dental defects, by region of birth

Region of Birth	Simple Restorations															
	None	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 or Over
NE	24.25	6.88	7.32	7.02	6.72	5.97	6.21	5.42	5.24	4.40	4.04	3.54	2.76	2.21	1.93	6.09
MA	22.28	6.90	7.36	7.18	6.88	7.02	6.68	6.54	5.58	4.95	3.85	3.18	2.59	1.90	1.58	5.53
ENC	31.22	8.36	7.88	7.49	7.13	6.28	6.25	4.61	4.50	3.68	3.01	2.29	1.90	1.57	1.12	2.71
WNC	36.75	9.43	8.78	7.01	6.78	5.68	5.09	4.23	3.75	2.86	2.63	1.91	1.52	0.89	0.63	2.06
SA	51.01	8.40	6.54	5.58	5.16	4.17	3.72	2.87	2.89	2.16	1.84	1.30	1.26	0.70	0.74	1.66
ESC	55.79	7.74	6.86	4.85	4.16	3.86	3.41	2.54	2.53	1.79	1.60	1.11	1.08	0.70	0.50	1.48
WSC	59.70	8.43	6.54	5.02	3.95	3.35	3.19	2.19	2.00	1.39	1.05	1.04	0.59	0.47	0.31	0.78
MT	44.59	8.93	8.42	6.07	5.64	4.90	4.85	3.79	3.10	2.64	1.77	1.42	1.17	0.40	0.65	1.66
PAC	32.35	8.51	7.47	6.74	7.19	7.02	5.96	5.66	4.59	3.37	2.55	2.10	1.62	1.01	1.03	2.83
ABR	27.18	9.92	7.97	7.48	8.18	8.46	6.08	5.10	4.40	3.42	3.14	2.09	1.47	1.26	0.98	2.87
Mean	38.51	8.35	7.51	6.44	6.18	5.67	5.14	4.29	3.86	3.07	2.55	2.00	1.60	1.11	0.95	2.77
Deviation	13.30	0.98	0.76	0.99	1.39	1.61	1.30	1.44	1.19	1.12	0.98	0.84	0.67	0.61	0.49	1.74
Error of mean	4.20	0.31	0.21	0.31	0.44	0.52	0.41	0.45	0.37	0.35	0.31	0.26	0.21	0.19	0.15	0.55

	Compound Restorations										
											10 and Over
NE	37.76	15.55	11.89	8.48	6.19	5.55	3.67	3.22	2.29	1.76	3.64
MA	36.92	15.83	12.48	9.69	6.50	5.10	3.76	2.88	2.34	1.49	3.01
ENC	43.31	14.02	11.01	8.51	6.02	4.29	3.44	2.56	1.94	1.70	3.20
WNC	49.07	13.37	9.52	7.15	5.54	3.94	2.78	2.32	1.94	1.12	3.25
SA	67.27	10.79	6.99	4.50	2.91	2.08	1.54	1.06	0.89	0.79	1.18
ESC	70.62	10.04	6.35	3.74	2.70	1.98	1.25	0.90	0.75	0.47	1.20
WSC	71.87	10.40	6.45	4.13	2.59	1.53	0.85	0.74	0.39	0.39	0.66
MT	55.77	13.70	8.77	6.32	4.52	2.67	2.53	1.55	1.20	1.01	1.96
PAC	42.82	12.36	9.57	7.81	5.89	4.27	4.08	2.84	2.80	2.05	5.51
ABR	37.59	13.91	12.16	8.74	6.99	5.66	3.70	3.00	2.59	1.40	4.26
Mean	51.3	13.00	9.52	6.91	4.98	3.71	2.76	2.11	1.71	1.22	2.79
Deviation	14.08	2.00	2.36	2.13	1.68	1.53	1.17	0.95	0.84	0.56	0.51
Error of mean	4.45	0.63	0.75	0.67	0.53	0.48	0.37	0.30	0.26	0.18	0.16

dental defects have been determined by region of birth and age group (Tables 5 and 6). The distribution agrees with that of the previous report.[1] A cumulative frequency table has been prepared for the entire population studied for each dental defect (Table 7).

The reason for the large number of persons with four teeth missing presumably is the preponderance of young men in the sample (mean age 23.81 years). Unerupted third molars are a frequent occurrence in the 17-19 age group and, since these are counted as missing teeth, the mean for the entire group is raised.

Time Required for Treatment

It was possible, by the method indicated in the procedure, to estimate the dental officer man years required to treat the dental defects occurring in naval personnel born in different geographic regions. When this was done, differences appeared not only in the amount of dental work required in personnel from different regions but also in the amount of work already expended (Table 8). The mean time required to treat the dental defects in personnel ranged from 0.00528 dentist years in New England to 0.00329 dentist years in the

Table 3 (Continued)

Region of Birth	Simple Cavities										
	None	1	2	3	4	5	6	7	8	9	10 or More
NE	28.30	10.74	9.96	9.82	9.26	6.50	6.86	3.67	3.54	2.54	8.81
MA	29.25	11.14	11.32	9.91	9.20	6.41	5.45	4.20	3.15	2.42	7.55
ENC	36.70	11.75	11.58	9.48	8.52	5.12	4.59	3.34	2.63	1.81	4.48
WNC	39.45	13.67	10.75	9.90	7.66	4.92	4.71	2.41	1.84	1.91	2.78
SA	29.52	12.86	12.56	11.18	9.23	6.20	5.65	3.19	2.48	2.02	5.12
ESC	31.75	11.65	11.08	10.25	8.61	6.09	5.33	3.43	3.09	2.49	6.23
WSC	38.54	13.16	10.98	9.44	8.07	5.38	4.57	2.76	2.04	1.81	3.25
MT	35.07	14.57	12.12	11.46	8.38	5.53	4.22	2.61	1.82	1.36	2.86
PAC	36.33	13.88	11.83	10.86	8.37	5.10	4.95	2.46	1.70	1.60	2.92
ABR	46.19	12.44	11.04	9.64	5.66	4.19	2.72	1.74	1.81	1.40	3.17
Mean	35.11	12.59	11.32	10.19	8.30	5.54	4.90	2.98	2.41	1.94	4.72
Deviation	5.58	1.26	0.74	0.72	1.06	0.74	1.07	0.71	0.66	0.42	2.16
Error of mean	1.76	0.40	0.23	0.23	0.33	0.23	0.34	0.22	0.21	0.13	0.68
	Compound Cavities										
NE	53.28	18.26	10.51	6.98	3.66	2.26	2.26	0.90	0.63	0.48	0.78
MA	58.23	18.78	10.33	5.32	2.92	1.52	1.12	0.63	0.48	0.26	0.41
ENC	59.31	18.11	11.32	5.58	2.46	1.28	0.96	0.33	0.23	0.19	0.23
WNC	62.54	16.77	8.81	5.24	2.72	1.54	1.32	0.43	0.23	0.18	0.22
SA	68.97	16.24	7.39	3.55	1.60	0.82	0.64	0.29	0.20	0.09	0.21
ESC	67.56	15.80	7.50	4.19	2.52	1.11	0.64	0.23	0.19	0.10	0.16
WSC	70.14	15.22	7.62	3.71	1.67	0.68	0.54	0.17	0.10	0.05	0.10
MT	63.65	16.48	9.70	4.38	2.26	1.28	1.19	0.38	0.19	0.11	0.38
PAC	59.69	17.60	9.40	6.43	2.95	1.67	0.94	0.50	0.31	0.23	0.28
ABR	66.77	15.86	8.94	4.33	1.88	0.84	0.62	0.35	0.21	0.07	0.13
Mean	63.01	16.91	9.15	4.97	2.46	1.30	1.02	0.42	0.26	0.176	0.29
Deviation	5.21	1.21	1.35	1.14	0.63	0.47	0.51	0.212	0.172	0.128	0.199
Error of mean	1.65	0.38	0.43	0.36	0.20	0.15	0.16	0.07	0.054	0.041	0.063

West South Central region. Thus personnel from New England required 62 per cent more time than did personnel from the West South Central region for treatment of dental defects according to naval standards. It was also of interest to note that these two regions were the high and low, respectively, in the amount of dental care already expended (New England, 0.00313, and West South Central, 0.00110 dentist years). Personnel from New England received 185 per cent more dental treatment than personnel from the West South Central region prior to entering the Navy. The ratio of time required to time expended may give an indication of the dental attention in the various regions. By this computation personnel from the Pacific area appeared to receive the most dental attention in proportion to the number of defects, and personnel from the East South Central region the least attention (Table 8). It is apparent from these calculations that region of birth is a more important determinant of how much dental care is necessary upon entrance into the service than is the amount of dental care already expended.

If the ratio of dental work required to dental work expended for the various regions is compared with the regional

Table 3 (Continued)

Region of Birth	Teeth Missing											
	None	1	2	3	4	5	6	7	8	9	10-31	32
NE	5.80	4.49	7.45	10.59	19.62	13.95	11.24	7.32	6.17	3.26	8.50	1.61
MA	4.82	5.45	8.92	11.58	18.74	13.91	11.36	7.85	3.29	5.45	7.49	1.14
ENC	7.31	6.50	9.97	11.53	19.68	11.92	9.29	6.55	4.11	2.61	8.63	1.90
WNC	11.19	8.44	11.72	12.78	21.81	9.84	7.36	4.52	3.30	1.83	5.38	1.83
SA	12.42	8.59	10.97	11.85	26.55	10.09	6.57	3.61	2.65	1.55	4.09	1.06
ESC	14.24	9.40	11.99	12.28	27.04	8.72	6.02	3.29	1.71	1.09	2.76	1.46
WSC	15.81	10.67	12.60	12.49	24.98	8.38	5.27	2.91	2.20	0.99	2.74	0.96
MT	13.62	8.96	10.84	12.20	24.64	10.68	6.97	3.62	2.12	1.28	3.68	1.39
PAC	9.84	7.66	10.56	12.06	26.57	11.31	7.09	4.36	2.43	1.74	4.92	1.46
ABR	8.95	6.08	10.41	10.90	15.87	9.43	7.97	6.15	5.17	3.98	12.30	2.79
Mean	10.40	7.62	10.54	11.83	22.55	10.82	7.91	5.02	3.31	2.38	6.05	1.56
Deviation	3.71	1.94	1.51	0.69	3.93	1.96	2.08	1.79	1.44	1.45	3.10	0.53
Error of mean	1.17	0.61	0.48	0.22	1.24	0.62	0.66	0.57	0.46	0.46	0.98	0.17

	Teeth To Be Extracted					
						5 and Over
NE	87.94	7.98	2.79	0.65	0.30	0.34
MA	88.25	7.76	2.62	0.82	0.32	0.23
ENC	89.67	7.60	1.86	0.62	0.16	0.09
WNC	91.05	5.86	1.86	0.69	0.22	0.32
SA	85.15	9.45	3.57	1.06	0.34	0.40
ESC	91.39	5.81	1.86	0.49	0.19	0.26
WSC	93.47	4.26	1.35	0.39	0.29	0.24
MT	93.90	3.95	1.09	0.65	0.19	0.22
PAC	94.96	2.95	1.13	0.42	0.31	0.23
ABR	92.31	4.96	1.96	0.42	0.14	0.21
Mean	90.81	6.06	2.01	0.62	0.25	0.25
Deviation	3.06	2.08	0.78	0.21	0.0734	0.0843
Error of mean	0.97	0.66	0.25	0.066	0.023	0.027

mean incomes[9, 10] and regional distribution of dentists,[11] some interesting relations appear. Both mean income and the number of dentists per capita correlate highly with the amount of dental attention (ratio of work required to work expended). The rank order correlation coefficients determined for these factors were 0.93 and 0.90, respectively (based on data in Table 8). The work already expended was highly correlated with dentists per capita and mean income: 0.76 and 0.87, respectively. The close relation between dental attention and mean income and also number of dentists is not surprising, especially since the number of dentists per capita is related to regional mean incomes.

In contrast to the relations discussed above, the amount of dental work required did not correlate significantly with mean incomes or dentists per capita.

9. U. S. Department of Commerce, Per Capita Income Payments (Dollars), in *World Almanac and Book of Facts*. New York: World-Telegram, 1946, p.662.

10. U. S. Bureau of the Census, United States Population (Official Census), 1940, in *World Almanac and Book of Facts*. New York: World-Telegram, 1946, p.456.

11. O'Rourke, J. T., An Analysis of the Number and Distribution of Active Dentists in the United States. *J.A.D.A.* 31:1097 (August 1) 1944.

Table 4.—Average number of specific dental defects per person, by age and region of birth

Region of Birth	17-19	20-24	25-29	30-34	35-39	40-44	45 and Over	Standard Number* per Person, All Ages
Simple Cavities								
NE	4.5	4.1	2.9	2.0	1.6	1.7	0.8	3.6
MA	4.2	3.9	2.5	1.7	1.3	1.4	1.1	3.6
ENC	3.6	3.3	2.1	1.6	1.3	1.2	0.8	2.7
WNC	2.9	2.7	2.2	1.8	1.2	1.1	0.5	2.5
SA	3.3	3.3	2.5	1.9	1.3	1.5	1.1	2.9
ESC	3.4	3.6	2.4	1.9	1.8	1.5	1.1	3.1
WSC	2.7	2.8	2.1	1.7	1.2	1.1	0.8	2.4
MT	2.6	2.6	2.2	1.8	1.4	1.5	0.6	2.4
PAC	2.7	2.6	2.0	1.5	1.2	1.1	0.7	2.3
ABR	3.4	2.9	2.0	1.2	1.3	1.1	1.0	2.6
ALL	3.4	3.3	2.3	1.7	1.4	1.3	0.9	2.9
Compound Cavities								
NE	1.3	1.3	1.2	1.1	0.97	1.1	0.42	1.2
MA	1.1	1.0	0.91	0.77	0.70	0.70	0.68	0.97
ENC	0.99	0.95	0.85	0.73	0.63	0.56	0.60	0.90
WNC	0.93	0.88	0.91	0.83	0.63	0.47	0.47	0.87
SA	0.54	0.64	0.82	0.62	0.64	0.77	0.37	0.64
ESC	0.68	0.69	0.77	0.68	0.58	0.55	0.41	0.69
WSC	0.57	0.63	0.62	0.53	0.44	0.49	0.30	0.59
MT	0.70	0.84	0.85	1.0	0.62	1.0	0.68	0.81
PAC	0.98	0.97	0.93	0.69	0.52	0.61	0.33	0.90
ABR	0.99	0.88	0.67	0.48	0.53	0.45	0.48	0.81
ALL	0.84	0.87	0.90	0.73	0.63	0.65	0.50	0.83
Simple Restorations								
NE	4.4	5.8	5.7	5.7	5.8	3.7	3.2	5.3
MA	4.4	5.6	6.1	5.9	5.3	3.8	2.6	5.3
ENC	3.0	4.3	4.8	4.7	4.3	3.3	2.3	3.8
WNC	2.2	3.3	4.1	4.4	3.6	3.0	2.8	3.2
SA	1.7	2.7	3.7	4.0	3.9	2.9	1.7	2.8
ESC	1.2	2.2	3.5	3.9	4.3	2.6	1.9	2.4
WSC	1.1	1.7	2.5	2.9	2.5	2.1	2.1	1.8
MT	2.0	3.0	3.5	3.5	3.0	2.1	2.3	2.8
PAC	3.1	4.2	4.6	5.0	4.6	4.1	3.4	4.1
ABR	3.1	4.7	4.2	4.1	4.7	2.6	2.6	4.1
ALL	2.5	3.8	4.4	4.4	4.2	3.1	2.5	3.6

*Adjusted for varying numbers of persons in each age group.

Table 4 (Continued)

Region of Birth	17-19	20-24	25-29	30-34	35-39	40-44	45 and Over	Standard Number per Person, All Ages
Compound Restorations								
NE	1.7	2.3	2.9	3.4	3.3	2.2	2.5	2.4
MA	1.5	2.3	3.0	3.3	3.4	2.8	1.9	2.3
ENC	0.97	2.0	2.8	3.2	3.3	2.7	1.8	2.0
WNC	0.81	1.7	2.4	3.0	2.6	2.2	2.3	1.8
SA	0.46	0.97	1.7	2.3	2.3	2.3	0.81	1.2
ESC	0.31	0.71	1.6	2.1	2.5	1.6	1.4	0.99
WSC	0.29	0.55	1.2	1.7	1.6	1.5	0.77	0.76
MT	0.73	1.4	2.0	2.7	2.2	1.9	1.7	1.5
PAC	1.4	2.6	3.3	4.3	4.2	3.2	2.2	2.6
ABR	1.2	2.4	3.1	2.6	2.7	1.8	2.2	2.2
ALL	0.88	1.6	2.3	2.8	2.8	2.3	1.75	1.7
Teeth Missing								
NE	4.9	4.8	6.1	7.1	8.9	12.3	14.5	5.7
MA	4.9	4.4	5.6	6.8	8.6	11.4	18.1	5.4
ENC	4.5	4.1	5.5	6.9	8.5	11.2	15.0	5.2
WNC	3.9	3.3	4.6	5.9	7.1	10.3	12.4	4.3
SA	4.0	3.2	4.1	6.0	7.6	12.0	14.6	4.4
ESC	3.6	2.8	4.0	5.5	6.7	11.4	16.8	3.9
WSC	3.6	2.7	3.2	4.4	6.8	7.8	12.9	3.6
MT	3.9	3.3	4.4	5.2	7.9	10.1	17.5	4.3
PAC	3.9	3.6	5.4	6.4	9.2	11.4	13.9	4.8
ABR	4.6	4.0	5.6	6.1	7.7	12.6	10.1	5.0
ALL	4.2	3.7	4.8	6.0	7.8	10.9	14.6	5.0
Teeth To Be Extracted								
NE	0.23	0.18	0.21	0.14	0.14	0.10	0.10	0.19
MA	0.21	0.19	0.17	0.14	0.09	0.14	0.06	0.18
ENC	0.15	0.16	0.13	0.11	0.06	0 11	0.05	0.14
WNC	0.15	0.16	0.15	0.13	0.11	0.06	0.15	0.15
SA	0.23	0.26	0.22	0.21	0.13	0.23	0.15	0.23
ESC	0.13	0.15	0.12	0.12	0.08	0.42	0.05	0.14
WSC	0.01	0.10	0.11	0.13	0.10	0.11	0.05	0.08
MT	0.11	0.09	0.08	0.13	0.04	0.15	0.05	0.20
PAC	0.09	0.09	0.10	0.05	0.07	0.14	0.00	0.09
ABR	0.23	0.11	0.12	0.10	0.10	0.43	0.01	0.15
ALL	0.17	0.17	0.15	0.14	0.10	0.17	0.08	0.16

Table 5.—Observed mean and median number of dental defects per person, by region of birth

Dental Defect		NE	MA	ENC	WNC	SA	ESC	WSC	MT	PAC	ABR
Simple cavities:	Mean	3.7	3.4	2.7	2.3	2.9	3.1	2.4	2.4	2.4	2.1
	Median	2.1	1.8	1.1	0.8	1.6	1.6	0.9	1.0	1.0	0.3
	25%	0	0	0	0	0	0	0	0	0	0
	75%	5.1	4.6	3.6	3.2	4.0	4.3	3.4	3.2	3.2	2.6
Compound cavities:	Mean	1.2	1.0	0.9	0.8	0.6	0.7	0.6	0.8	0.9	0.7
	Median	0	0	0	0	0	0	0	0	0	0
	25%	0	0	0	0	0	0	0	0	0	0
	75%	1.3	0.9	0.9	0.7	0.4	0.5	0.3	0.7	0.8	0.5
Simple restorations:	Mean	5.4	5.3	4.1	3.4	2.6	2.3	1.9	2.8	3.9	4.2
	Median	3.7	3.9	2.3	1.4	0	0	0	0.6	2.2	2.7
	25%	0.1	0.4	0	0	0	0	0	0	0	0
	75%	8.0	7.7	6.1	5.1	3.7	3.0	2.1	4.3	6.0	6.0
Compound restorations:	Mean	2.4	2.3	2.1	1.9	1.1	0.9	0.8	1.5	2.5	2.5
	Median	0.8	0.8	0.5	0.1	0	0	0	0	0.6	0.9
	25%	0	0	0	0	0	0	0	0	0	0
	75%	3.2	3.0	2.8	2.4	0.7	0.4	0.3	1.6	3.4	3.4
Teeth missing:	Mean	5.7	5.4	5.4	4.6	4.2	3.9	3.6	4.1	4.5	6.0
	Median	4.1	4.0	3.5	3.5	3.2	3.1	2.9	3.2	3.4	3.9
	25%	2.7	2.5	2.1	1.5	1.4	1.1	0.9	1.2	1.7	2.0
	75%	6.2	6.0	5.9	4.9	4.4	4.0	3.9	4.4	4.7	6.9
Teeth to be extracted:	Mean	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	Median	0	0	0	0	0	0	0	0	0	0
	25%	0	0	0	0	0	0	0	0	0	0
	75%	0	0	0	0	0	0	0	0	0	0

Mean = average number of defects per person.
Median = 50 per cent with the number of defects indicated or below.
25%-75% = those persons with the number of defects indicated or below.

From these findings one may conclude that the relative amount of dental attention in this country is independent of dental status, and correspondingly that availability of dentists is unrelated to the dental needs of the various regions.

Optimum Distribution of Dentists

On the basis of the data in this report, it is possible to calculate the optimum distribution of existing dentists according to regional needs. The regional needs were computed by multiplying the number of persons in each region by the mean time required to treat (work expended plus work required) personnel from that region (Table 8). The total time required to treat (work expended and work required) the population in each region was expressed as a percentage of the total time for the nation. This percentage, which represents the relative amount of dental care required in each region, was multiplied by the total number of dentists available in the country. For example, New England had a mean of 0.00841 dentist years expended and required to treat dental defects; this figure multiplied by the number of persons in that region (8,437,290) yields a total of 70,958 dentist years required in that region. This number of dentist years is 8.6 per cent of the total time required for the country, and hence this region should have 8.6 per cent of the practicing dentists.

Table 6.—Observed mean and median number of dental defects per person, by age groups

Dental Defect		17-19	20-24	25-29	30-34	35-39	40-44	45+	All Ages
Simple cavities:	Mean	3.4	3.3	2.3	1.7	1.4	1.3	0.9	2.9
	Median	2.0	1.7	0.7	0	0	0	0	1.2
	25%	0	0	0	0	0	0	0	0
	75%	4.4	4.3	3.0	2.2	1.5	1.5	0.3	3.7
Compound cavities:	Mean	0.8	0.9	0.9	0.7	0.6	0.6	0.5	0.8
	Median	0	0	0	0	0	0	0	0
	25%	0	0	0	0	0	0	0	0
	75%	0.8	0.8	0.7	0.5	0.3	0.2	0	0.7
Simple restorations:	Mean	2.5	3.8	4.4	4.4	4.2	3.1	2.5	3.6
	Median	0.1	1.6	2.4	2.7	2.4	0.9	0	1.4
	25%	0	0	0	0	0	0	0	0
	75%	3.8	5.7	6.5	6.7	6.2	4.5	3.7	5.4
Compound restorations:	Mean	0.9	1.6	2.3	2.8	2.8	2.3	1.8	1.7
	Median	0	0	0.7	1.2	1.2	0.3	0	0
	25%	0	0	0	0	0	0	0	0
	75%	0.7	2.0	3.2	4.0	4.9	3.1	2.2	2.2
Teeth missing:	Mean	4.2	3.7	4.8	6.0	7.8	10.9	14.6	4.7
	Median	3.6	3.0	3.3	3.9	5.0	6.6	8.9	3.4
	25%	2.7	1.1	1.3	1.8	2.6	3.4	3.9	1.7
	75%	4.6	4.4	5.6	6.8	8.7	9.5	11.2	5.2
Teeth to be extracted:	Mean	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2
	Median	0	0	0	0	0	0	0	0
	25%	0	0	0	0	0	0	0	0
	75%	0	0	0	0	0	0	0	0

Mean = average number of defects per person.
Median = 50 per cent with the number of defects indicated or below.
25%-75% = those persons with the number of defects indicated or below.

The differences between the actual number of dentists in each region and the computed number of dentists are presented in Table 9. In addition to the calculation of the number of dentists distributed according to regional needs, another distribution of dentists per region has been determined by multiplying the national mean for dentists per capita by the number of people in each region. When these three items are compared (distribution of dentists according to needs, distribution of dentists equally by population and actual distribution of dentists), it is found that New England has more dentists than its share if only an equal distribution of dentists per capita over the entire country is considered. If regional needs are taken into account, New England does not have its share of the country's dentists. A different situation exists for the East South Central region. This region would receive more dentists on the basis of an equal per capita basis than it would if dentists were distributed according to need (this region also requires more dentists than it now has if it is to share equally in the nation's supply of dentists).

These figures should not be construed as indicating the absolute number of dentists required in any region. They represent only the apportioning of present dentists according to estimated rela-

Table 7.—Cumulative percentage of dental defects of naval personnel

Simple Cavities		Compound Cavities		Simple Restorations		Compound Restorations		Teeth Missing		Teeth To Be Extracted	
No.	Σ %	No.	Σ %	No.	Σ %	No.	Σ %	No.	Σ %	No.	Σ %
0	35.1	0	63.0	0	38.5	0	51.3	0	10.4	0	90.81
1	47.7	1	80.0	1	46.9	1	64.3	1	18.0	1	96.9
2	59.0	2	89.1	2	54.4	2	73.8	2	28.6	2	98.9
3	69.2	3	94.0	3	60.8	3	80.7	3	40.4	3	99.5
4	77.5	4	96.5	4	70.0	4	85.7	4	62.9	4	99.8
5	83.0	5	97.8	5	72.7	5	89.4	5	73.8	5+	100.00
6	87.9	6	98.8	6	77.8	6	92.2	6	81.7		
7	90.9	7	99.2	7	82.1	7	94.3	7	86.7		
8	93.3	8	99.5	8	86.0	8	96.0	8	90.0		
9	95.3	9	99.7	9	89.0	9	97.2	9	92.4		
10+	100.00	10+	100.00	10	91.6	10+	100.00	10-31	98.4		
				11	93.6			32	100.00		
				12	95.2						
				13	96.3						
				14	97.2						
				15+	100.00						

Σ = cumulative.

tive regional needs. Thus the Pacific region, which has 33 per cent more than its share of the total dentists in this country according to the needs of all regions, is undoubtedly far short of its actual requirements.

Application of naval dental standards to personnel entering the service in 1941 resulted in the rejection of 7 per cent. The degree to which these standards operated may be illustrated by the fact that 90.81 per cent of the 71,015 in this study who were accepted by the Navy needed no teeth extracted.

Since the caries process has been shown to be more pronounced in the New England and Middle Atlantic regions, it seems that persons from these regions had

Table 8.—Ratio of dentist years required to dentist years expended per person, civilian mean income and dentist distribution

Regions	A	B	B/A	1941	1940
	Dentist Years		Index of Dental Attention	Mean Income (Dollars)	Dentist-Population Ratio
	Expended	Required			
NE	0.00313	0.00528	1.69	865.58	1:1,674
MA	0.00305	0.00475	1.56	894.26	1:1,457
ENC	0.00248	0.00398	1.60	791.17	1:1,630
WNC	0.00171	0.00374	2.18	581.09	1:1,591
SA	0.00150	0.00390	2.60	521.00	1:3,001
ESC	0.00130	0.00418	3.22	360.85	1:4,780
WSC	0.00110	0.00329	2.99	446.49	1:3,320
MT	0.00171	0.00353	2.06	594.31	1:2,171
PAC	0.00256	0.00349	1.36	923.99	1:1,290
Mean	0.00211	0.00406	1.92	693.00	1:1,869

Table 9.—Distribution of all dentists in United States according to regional needs as indicated by examination of naval personnel*

Region	A Total Population, 1940	B Mean Dentist Years Required and Expended per Person	C Total Dentist Years Required per Region (A×B)	D Per Cent of Total Time (C÷ΣC ×100)	E Actual Distribution of Dentists, 1940	F Calculated Distribution of Dentists by Regional Needs (D×ΣE)	G Difference (E−F)	H Per Cent Difference (E−F)÷ E×100	I Distribution of Dentists by Population Alone (ΣE÷ΣA) ×n
NE	8,437,290	0.00841	70,958	8.604	5,038	6,058	−1020	−20.25	4,512
MA	27,539,487	0.00780	214,808	26.045	18,900	18,340	+ 560	+ 2.96	14,728
ENC	26,626,342	0.00646	172,006	20.856	16,327	14,686	+1641	+10.05	14,240
WNC	13,516,986	0.00545	73,668	8.932	8,493	6,289	+2204	+25.95	7,229
SA	17,823,151	0.00540	92,245	11.670	5,606	8,217	−2611	−46.58	9,532
ESC	10,778,225	0.00548	59,065	7.162	2,662	5,043	−2381	−89.44	5,764
WSC	13,064,525	0.00439	57,353	6.954	3,934	4,897	− 963	−24.48	6,987
MT	4,150,003	0.00524	21,746	2.637	1,911	1,857	+ 54	+ 2.82	2,219
PAC	9,733,262	0.00605	58,886	7.140	7,544	5,028	+2516	+33.35	5,205
Total	131,669,271	.....	820,735	100.000	70,415	70,415	.....	.....	70,416

*Figures do not imply actual numbers required but merely an equitable distribution of existing dentists.

teeth extracted because of complications arising from dental caries. The caries process being less pronounced in the East South Central and West South Central regions, it may be proper to assume that teeth had to be extracted for conditions other than dental caries, possibly for periodontosis.

The data of this report do not suggest any definite age beyond which naval recruits are unsuitable from a dental standpoint. Although the number of missing teeth increases with age, this fact does not appear to be of practical significance until 35 and over, when applicants are likely to be rejected for other than dental reasons. Whatever age limits are set up for recruiting by the services, educational and medical factors other than dental seem generally more important in determining the criteria for acceptance.

The lack of relation between dental caries and dental treatment rendered suggests that general education of the public has been insufficient or that lay dental education is unimportant in the total dental picture. Although dental attention per person was found to be related to dentists per capita, the absolute number of cavities per person was unrelated to the number of dentists in any one region. It thus appears that the presence of a large number of dentists in any region resulted in repair of dental defects but did not contribute either directly or indirectly to caries preventive measures. The apportioning of dentists by region appears to be an economic factor and is unrelated to regional needs.

Summary

1. Variations appeared in the mean time required to treat the dental defects in naval persons from different geographic regions, and also in the mean time already spent in treatment prior to entrance into the service. The West South Central region was lowest for both dental work expended per person (0.0011 dentist years) and work required (0.0033 dentist years); the New England region was highest for both factors (0.0031 and 0.0053 dentist years, respectively). The ratio of dental work required to dental work expended suggests that personnel

from the Pacific region received the most dental attention in proportion to the number of dental defects, prior to entrance into the service. The same ratio for the East South Central region suggests that this region had the least dental attention in proportion to the number of dental defects.

2. The ratio of dentist years of dental treatment required to dentist years received may be utilized as an index of dental attention in populations. The validity of such use of this ratio is supported by the high correlation which existed between this ratio, mean income and number of practicing dentists in the various regions.

3. The mean number of defects per person (corrected for examining error) for all regions and age groups was: 8.0 simple cavities; 2.2 compound cavities; 3.6 simple restorations; 1.7 compound restorations; 5.0 missing teeth; and 0.16 teeth to be extracted. The mean number of restorations estimated to be needed per person is therefore greater than the mean number already placed. The mean time estimated to treat the dental defects per naval person has been shown to be 0.00406 dentist years; by the same standards the mean time already spent in dental treatment at the time of examination was 0.00211 dentist years.

4. The number of dental defects per person has been shown to be related to region of birth and age. The mean number of compound cavities reported per person was the highest in New England (1.2), and lowest in the West South Central region (0.58). Simple cavities had the highest mean in New England (3.7) and the lowest in the Pacific region (2.3). Regional differences were also found for other dental defects with the Middle Atlantic and New England regions generally showing the greatest, and the East South Central and West South Central regions showing the least number per person. The number of missing teeth increased with age; the mean number of teeth missing per person was 4.2 in the 17-19 year old group and 14.6 for the 45 and older age group. Both simple and compound cavities were lowest in the 45 and older age group, presumably because of the large number of missing teeth.—*National Naval Medical Center.*

Dentistry and Medicine.—Medicine and medical education have troubles of their own which will not be alleviated by attempting to swallow whole another profession; a profession (dentistry) which, by and large, does not want to be engulfed. And a profession like dentistry, with a hundred-year history, deserves to have its feelings considered. You may call dentistry a specialty of medicine, but that does not make it so; and it is none the less valuable for that fact. I can see no reason why the degree, Doctor of Dental Surgery, honestly held and honorably upheld, should not in the future deserve equal respect and and esteem from the public with the degree of Doctor of Medicine, provided it is held by a similar type of man. And whatever their future relationship may be, let medicine and dentistry now go forward side by side as friendly collaborators in the estimable understanding of offering help to those who need it and adding to the happiness of life as much as to the length of its span.—*F. T. Van Beauren, Jr., "Dentistry: The Errant Branch: Shall Medicine Readopt It?" J. A. Am. M. Coll. 7:106, March 1932.*

FIBRIN FOAM AS A CLINICAL AID IN DENTAL SURGERY

Clemens V. Rault,* D.D.S., M.S.D., Bethesda, Md.

FIBRIN foam is one of the new by-products to emerge from the human plasma fractionation program of research sponsored by the United States government at Harvard University. Although its full potentialities are still in the experimental stage, fibrin foam has already been demonstrated to have value as a hemostatic agent in surgical operations on the brain, as well as in other fields of neurologic surgery.

Neurologists have long sought a suitable technic for the control not only of capillary bleeding but also of deep gross hemorrhage in cranial operations. These conditions prohibit control by clamping, by electrocoagulation or by direct pressure on delicate structures. There was a specific need for an adsorbable hemostatic substance, and fibrin foam in its present form was produced to meet this want. Maj. Barnes Woodhall[1] has reported that, in more than 200 neurosurgical operations in which fibrin foam was used as a clinical aid, the desired hemostatic effect was promptly obtained with no untoward tissue or physical reactions.

Since fibrin foam proved effective in controlling hemorrhage in neurosurgery, would it have a similar desired effect in oral surgery?

Read before the New York Section of the American College of Dentists, New York, May 17, 1945.

The opinions or assertions contained in this article are the private opinions or assertions of the writer, and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

*Captain (DC) USN; Naval Dental School, National Naval Medical Center.

1. Woodhall, Barnes, Fibrin Foam as a Hemostatic Agent in Rehabilitation Neurosurgery. *J.A.M.A.* 126: 469 (October 21) 1944.

Agent

Fibrin is the controlling factor in the chemophysical process by which the human blood clot is normally formed. It is a complex substance derived from fibrinogen, a normal constituent of blood, through activation by thrombin, another complex derivative of blood.

Fibrin foam is made by whipping liquid fibrinogen into a foam, clotting it by the addition of thrombin, then sterilizing and drying it. In its finished form, it has the appearance of a piece of dried bread. It is packaged for use in a vial containing 0.7 gm. of fibrin foam, along with two other vials, one containing 500 units of dried thrombin and the other, 30 cc. of normal saline solution.

The thrombin is first dissolved in the saline solution. When desired for use, a piece of the dry foam is cut to appropriate size (Fig. 1) and then soaked in the thrombin solution until it becomes thoroughly wet (Fig. 2). It is now ready for application. After excess moisture has been removed from the area, the foam is applied directly to the bleeding surface. Gentle pressure, preferably with a piece of gauze, is exerted to hold the foam in place until coagulation is complete. The fibrin foam is left *in situ*, becoming integrated into the clot.

So that a diversity of observation might be obtained, it was decided to dispense the foam to Navy Dental Corps surgeons in three clinics in the New York City area. A form was prepared, requesting a detailed report on each operation. Five

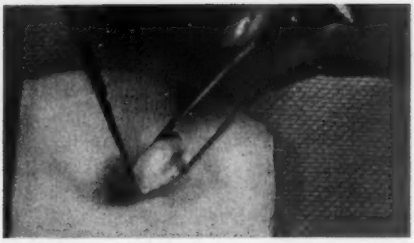

Fig. 1.—The dry fibrin foam is cut to appropriate size with sterile instruments

dental officers—Cmdr. S. S. Wald, USNR; Lt. Cmdr. Robert S. Hess, USNR; Lieut. Thomas I. Carey, USNR; Lieut. Paul R. Leprohon, USNR; and Lieut. W. F. Hadtke, USN—were requested to submit individual reports on their clinical observations.

The foam technic was employed in more than 200 cases of oral surgery, approximately 75 per cent of which were simple tooth extractions; 20 per cent, bone or tissue impactions; and the remaining 5 per cent, miscellaneous, including sixteen cases of fractured roots, four cystectomies, four apicoectomies and two antral openings. Salient points of the individual reports follow:

Cmdr. S. S. Wald's Report

Fibrin foam proved to be an excellent hemostat in the control of both primary bleeding and secondary hemorrhage. The size of the piece of foam inserted in the pocket is important because the foam expands considerably and too large a piece produces pressure symptoms. A piece one-third the size of the cavity was found most efficacious. The foam becomes a part of the clot and is well tolerated by the surrounding tissues.

Used in sockets of nonvital teeth and in infected areas, the foam appeared to promote granulation and healing, compared with control cases in which the foam technic was not employed. When used in conjunction with chemotherapeutic agents, such as penicillin or the sulfonamides, it insured the retention of the agents.

Its positive use is indicated in the following types of cases:

1. In extraction of nonvital teeth and in infected areas where blood circulation is poor.

2. In extraction of unerupted and infected third molars, especially lower third molars.

3. In gross lesions, such as cystic cavities, sinus infections and large areas of débridement where much bleeding is anticipated.

Lt. Cmdr. Robert S. Hess's Report

It can be definitely stated that fibrin foam and thrombin used in combination are nonirritating to the tissues within the tooth socket. Two or three days after an extraction, it is difficult to distinguish between the fibrin foam and the formed clot. In several instances, the patients pushed the foam out of the sockets, six hours to three days after insertion. In all cases but one, a healthy clot was found underneath, and even in the exception the socket caused no discomfort.

Two cases admitted to the hospital because of postoperative bleeding were observed. Both cases responded very well to the foam technic. The substance seems indicated for such cases because it is simple to use; it produces no tissue precipitating reaction, as Monsel's solution does; it eliminates the necessity of later dis-

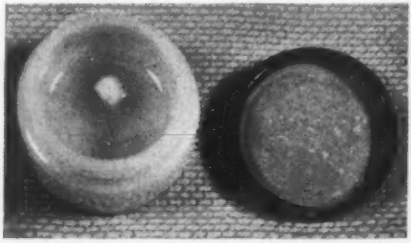

Fig. 2.—The fibrin foam is soaked in the thrombin solution for approximately three minutes

turbance of the wound, as is the case with a gauze-packed socket, later removal of the gauze leaving a hollow, dry and often painful socket.

Another type of case which appears to be benefited by use of the foam technic is that of the extraction of nonvital teeth, the sockets of which seem to heal slowly. One patient observed had four nonvital teeth extracted, three sockets of which were treated in the routine way (that is, by having the patient bite on dry sterile gauze for two or three minutes), and the fourth socket was treated with fibrin foam. In this case, the fourth socket healed in one week, while the other three sockets required three weeks to heal.

Even though the foam's mechanical protection may be an aid in healing, it is doubtful whether the use of fibrin foam is warranted in all cases, especially in uncomplicated simple extractions.

Lieut. Thomas I. Carey's Report

Seven patients gave a history of excessive bleeding after previous dental extractions. Fibrin foam was applied in all these cases and no hemorrhage occurred. Eight patients with no previous history of excessive bleeding had secondary hemorrhages after extractions at intervals varying from ten minutes to forty-eight hours. The application of fibrin foam in two of these cases was not effective, but in the remaining six cases hemorrhage was stopped and controlled.

The use of fibrin foam in twenty-five cases, including sixteen impacted lower molars, four cystectomies, four apicoectomies and one antral opening, indicated that the material may have use as a nonirritating support to tissue flaps, thus facilitating wound closure. It definitely becomes a part of the normal healing clot in wounds.[1,2] The foam should be held in place by tack sutures if there is little retentive support.

It is not believed that the foam technic is necessary for routine extractions. In seventeen cases where control wounds were observed, the use of fibrin foam was beneficial, whereas in fourteen instances there was no apparent benefit. In another group of thirty-five cases in which no control wounds were possible, it appeared subjectively that bleeding was controlled and healing accelerated in twenty-three cases, whereas there were no apparent benefits in the remaining twelve cases.

Lieut. Paul R. Leprohon's Report

The application of fibrin foam is simple and can be done routinely with little loss of operating time. It promotes rapid hemostasis and the formation of a clot immediately after extraction, thus sealing off the cavity before saliva, food particles and other debris have a chance to contaminate the wound. It also helps to hold the mucous membrane in its natural position, even though the underlying bony support has been lost. In impactions and flap operations, it sometimes eliminates the need for sutures because the rapid-forming clot brings the lips of the wound into approximation. Immediate application of the technic after an operation is contraindicated, however, where drainage is desired through the socket, for example, in badly abscessed teeth.

Lieut. W. F. Hadtke's Report

The application of fibrin foam brought immediate hemostasis in all cases where rapid clotting of the blood was desired. Because the foam's action is rapid enough to check the flow of blood, the socket should be permitted to fill completely with blood before the foam is inserted. The size of the piece of foam inserted should also be carefully considered. Too large a piece results in a clot, mostly fibrin foam, which is deeply concave and firmly attached within the socket. A piece a

1. Ingraham, F. D., and Bailey, O. T., The Use of Products from Human Fibrinogin and Human Thrombin in Neurosurgery. *J. Neurosurg.* 1:23 (January) 1944.
2. Bailey, O. T., and Ingraham, F. D., Chemical, Clinical, and Immunological Studies on the Products of Human Plasma Fractionation. *J. Clin. Investigation* 23:591 (October) 1944.

third the size of the cavity is ideal. Patients do not complain of any discomfort arising from the presence of the foam.

Summary of Conclusions

1. The use of fibrin foam and thrombin is not necessary in all tooth extractions. It is desirable, however, in that it promotes initial healing, by reducing the possibility of loss of the blood clot, with a resultant dry socket or other unfavorable sequelae.

2. It may be used in conjunction with chemotherapeutic agents, such as the sulfonamides or penicillin, having the additional advantage of holding the medicaments in place.

3. It is a valuable agent in the control of hemorrhage, both primary and secondary. Many patients complain of swallowing blood, or of the need to expectorate blood in a public place, or of having blood drool on their pillow while they are asleep. The use of fibrin foam overcomes the possibility of such annoyances and adds to the comfort of the patient.

4. The technic is particularly useful in the treatment of large cavities, such as those resulting from the removal of cysts. In these cases, fibrin foam not only controls hemorrhage but also acts as a matrix to support soft tissue flaps.—*National Naval Medical Center.*

GLOSSODYNIA: A STUDY OF IDIOPATHIC OROLINGUAL PAIN

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Symptoms

During the past ten years, we have observed a large number of patients who complained of pain and other abnormal sensations of the oral cavity. Their paresthesias were variously described as burning, itching, boring, stinging, dryness, a feeling of sand in the mouth, bad taste. As the most frequent site of symptoms of this nature is the tongue, the term "glossodynia" or "burning tongue" is often loosely applied, although the keratinized gingivae, the mucous membranes and even the throat and the floor of the mouth may be affected. The most typical patient is the postmenopausal woman, unduly emotionally disturbed over her oral condition and complaining of nervousness, depression, hopelessness or insomnia or having marked cancerphobia. Her oral sensation is frequently referred to as being "persistent and unbearable," even though it may have been present for years. In mild cases the signs are said to manifest themselves only under emotional stress, excitement or worry. Younger women who have had an artificial menopause may be affected. We have observed a few men with the same disorder, but we have seen no children.

There is usually no visible lesion, and the tongue and the mucous membranes appear normal. The patient frequently attributes her discomfort to some coexistent dental problem which, on close

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examination, generally appears to be no more than a precipitating or aggravating factor, or does not exist at all. Among such conditions are: the construction of dentures; the irritation of clasps and new fixed bridges; massive deposits of tartar on the teeth; the presence of sharp cusps, margins of cavities or spaces between the teeth which attract the tongue.

Causes

While numerous physical disorders may give rise to orolingual pain, there is also a syndrome of so-called "idiopathic glossodynia" where psychogenic factors seem to predominate. Schroff[1] classifies glossodynia according to causes into the following groups:

1. Deficiency states such as pernicious anemia (see also Hunter[2] and Harris[3]), pellagra, diabetes, severe secondary anemia, severe hemorrhages.

2. Disturbances of gastric secretion, hyperacidity, hypo-acidity or anacidity (see also Oatway and Middleton[4]).

3. Local causes, such as oral sepsis and galvanic current irritation (see also Lain[5]).

4. Psychogenic causes, cancerphobia, mental strain.

Engman[6] described nine cases, all of whom feared carcinoma of the tongue. A large neurotic element was present in eight others in whom no demonstrable lesion could be found. Fox[7] thought that the term "glossodynia" should be limited to those cases which are idiopathic or clearly psychogenic; he considered glossodynia to be a symptom rather than a disease entity.

The literature describes a wide variety of therapeutic measures. These include the removal of all dissimilar metals or the covering of the teeth with appliances to prevent oral galvanism, the ingestion of hydrochloric acid, liver injections, the administration of vitamins and local dental treatment. X-ray treatments were tried as a placebo.[7] However, all of these efforts resulted in little or no improvement in the idiopathic cases.

Many of the patients whom we have observed had previously been unsuccessfully treated by various specialists in medicine and dentistry.

Methods

For the purpose of this study, fourteen middle-aged women who complained of orolingual "burning" were observed over a period of a year and a half. They were taken in the order of their appearance in the dental clinic of the Columbia University-Presbyterian Hospital Medical Center. Only those without observable lesions were selected. In nine cases complete medical histories were obtainable from the Vanderbilt Clinic where these patients had been under treatment for other disorders. In all cases, pernicious anemia, hyperacidity or hypo-acidity or other probable systemic causes were ruled out by a review of the medical record or by physical examination, including blood tests.

There was a long initial interview by one of us (R. M.) to get a general history, but more specifically to evaluate the psychiatric status and to determine whether or not the symptoms might be associated with emotional factors. Brief follow-up interviews were for the most part devoted to observing progress or any change in the mental attitude. Re-

1. Schroff, Joseph: Burning Tongue. Rev. Gastroenterol. 2:347, December 1935.
2. Hunter, William: Severest Anemias. London: Macmillan and Company, Ltd., 1909.
3. Harris, F. G.: J. Cut. Dis. 33:742, 1915.
4. Oatway, W. H., Jr., and Middleton, W. S.: Correlation of Lingual Changes with Other Clinical Data. Arch. Int. Med. 49:860, May 1932.
5. Lain, E. S.: Chemical and Electrolytic Lesions of the Mouth Caused by Artificial Dentures. Arch. Dermat. & Syph. 25:21, January 1932.
6. Engman, M. F.: Burning Tongue. Arch. Dermat. & Syph. 1:137, February 1920.
7. Fox, H.: Burning Tongue. Glossodynia. New York State J. Med. 35:881, September 1, 1935.

assurance was given in some instances, but only one case received psychotherapy.

Our original hypothesis was that oral "burning" might be related to atrophy of the oral mucosa resulting from withdrawal of estrogen, just as vaginal burning and pruritis often occur during the menopause in relation to vaginal atrophy. Since the latter conditions are frequently relieved by replacement therapy, eleven of these patients were given estrogen in various ways. In a few cases, biopsies of the gingivae were made of the area where the alleged "burning" or pain was centered to determine whether or not the tissues were atrophic. Oral and vaginal epithelial smears were taken before, during and after treatment at about weekly intervals when possible. The results* obtained from the smears are given in another report.[8]

In order to view the problem as objectively as possible, the data obtained from the interviews, from oral and vaginal smears and from the biopsies were evaluated separately by each investigator and the results compared later. Ringer's solution was injected into the arm as a placebo in two cases. Two cases were given topical applications of a petroleum ointment as a placebo without effect.

Case Histories

Case 1.—The patient, aged 54, had experienced the menopause five and one-half years previously.

History and Physical Examination.—The patient complained of burning, dryness and stinging of the tongue, gingivae and oral mucous membranes. The symptoms had started three months previously, when her second son left for military service. The posterior teeth were missing.

The patient had had a hysterectomy, and mild genital atrophy was present. The blood count was normal.

Psychiatric Examination.—The patient was tense, depressed and anxious. She reported financial worry and marital conflict. Her husband was an invalid and the couple had not had sexual intercourse for some time.

Treatment.—Diethylstilbesterol, 1 mg. every other day, was administered for twenty-two days.

Outcome.—The burning in the mouth stopped eighty-three days after treatment was discontinued, when the son returned on a furlough. The menses were reestablished for five months after therapy.

Case 2.—The patient, aged 56, had experienced the menopause fifteen years previously.

History and Physical Examination.—The patient reported that she had suffered from burning, shooting pain in the gingivae and oral mucous membranes for one and one-half years, since an antrum operation. The posterior teeth were missing.

Examination disclosed slight vaginal atrophy and vaginal pruritus.

Psychiatric Examination.—The patient wept frequently and showed marked hysterical conversion symptoms and emotional lability. She was a hypochondriac and suffered from cancerphobia. Her husband had deserted her sixteen years previously. She was frigid and continent, and sexual symbolism was evident in her dreams and in her bizarre descriptions of her pain. She was poverty-stricken, demanding and snobbish.

Treatment.—Diethylstilbesterol was given in doses of 1 mg. daily for six days and every other day for ninety days.

Outcome.—There was no improvement in the patient's condition, and the patient berated physicians.

Case 3.—The patient, aged 55, had experienced the menopause ten years previously.

History and Physical Examination.—The patient, wearing full dentures, complained

*It was shown that the oral and vaginal epithelial cells undergo parallel changes in cornification during the menstrual cycle and during estrogen therapy in amenorrhea. The oral mucosa seems to have a higher threshold to estrogen than does the vaginal, as it responds more slowly to substitution therapy and larger doses are needed. The cyclic hormonal changes are harder to evaluate in the oral than in the vaginal smear, and the oral smear cannot be used to study ovulation, as the changes are obscure.

8. Ziskin, D. E., and Moulton, Ruth: Oral and Vaginal Epithelial Smears in Psychosomatic Research (in press).

that her gingivae were sensitive and painful on pressure since the extraction of her teeth one year ago.

Hypertension was present, and the blood count was normal.

Psychiatric Examination.—The patient was single, and had a strong aversion to men and to the idea of marriage. She had always suffered from dysmenorrhea. She had a fear of cancer and a paranoic anxiety about being evicted from her house. She was querulous and showed senile mental changes.

Treatment.—Estradiol benzoate, 10,000 rat units, was administered in a single injection, and diethylstilbesterol was given in doses of 1 mg. daily for forty-nine days.

Outcome.—No improvement in the patient's condition was evident.

Case 4.—The patient, aged 56, had experienced the menopause nine years previously.

History and Physical Examination.—The patient, wearing partial dentures, complained of burning in the gingivae and mucous membranes of the mouth over a period of two months, after she had painted iodine on mouth blisters. She also complained of pains in her fingers.

Atrophy of the vulva, vagina and cervix was present, and the uterus was not palpable. The blood count was normal.

Psychiatric Examination.—The patient's husband had died of cancer twelve years previously, and the woman suffered from cancerphobia. She was lonely, tearful and anxious about money. The burning in her mouth was more severe when she was nervous.

Treatment.—A dose of 1 mg. of diethylstilbesterol was administered daily for seventeen days.

Outcome.—A week after cessation of treatment, the patient resumed her social activities and experienced relief from the burning in her mouth. Relief continued while the patient was under observation, but six months later the condition was worse.

Case 5.—The patient, aged 52, had experienced the menopause three years previously.

History and Physical Examination.—The patient complained of burning in the gingivae and mucous membranes of the mouth since the death of her husband, two years previously. Other symptoms included burning and stinging around the eyes and lips and excessive thirst. The patient was wearing full dentures.

Vaginal pruritus was present.

Psychiatric Examination.—Since her husband's death, the patient was subject to insomnia and periods of depression, and she wept and thought of her husband at night. She craved affection and felt that she was a lonely martyr.

Treatment.—Diethylstilbesterol was administered in doses of 1 mg. daily for seven days and ¼ mg. daily for sixteen days. Estradiol benzoate injections, 10,000 rat units a week, were given for five weeks.

Outcome.—The patient obtained no relief while taking diethylstilbesterol. She experienced slight relief when the injections of estradiol benzoate were begun, but the symptoms soon returned and were still present three months after discontinuance of the treatment.

Case 6.—This patient, aged 56, had experienced the menopause ten years previously.

History and Physical Examination.—The patient complained of burning pain in the gingivae and mucous membranes for eight months after acquisition of partial dentures.

She had hypertensive heart disease and exhibited anginal syndrome.

Psychiatric Examination.—The patient, a hypochondriac, suffered from cancerphobia. She believed that wearing dentures causes heart pain, and she washed her dentures thirty times daily. She had been widowed for twenty-three years, and hated marriage and men. She was subject to fits of extreme rage.

Treatment.—Diethylstilbesterol in doses of ½ to 1 mg. daily was administered for eighteen days; Benzestrol in doses of 1 to 2 mg. daily was given for twenty-eight days.

Outcome.—The patient showed no improvement.

Case 7.—This patient, aged 44, had normal menstruation.

History and Physical Examination.—The patient complained of burning lips, tongue, gingivae and mucous membranes of the mouth. She attributed this condition, which had been present for about a year, to the extraction of her teeth. She was wearing full dentures.

Examination revealed slight vaginal atrophy and a small uterus. The patient suffered from a Trichomonas infection.

Psychiatric Examination.—The patient was single and lonely. She was retiring and placid, and showed no anxiety, but she had a tendency to complain.

Treatment.—No treatment was given.

Outcome.—The case was not followed up.

Case 8.—The patient, aged 55, had experienced the menopause twelve years previously.

History and Physical Examination.—The patient reported burning of the tongue and mucous membranes over a period of one month. The throat was dry and the voice was hoarse. Only three teeth were missing but the patient's mouth disclosed poor hygiene.

The uterus and vagina were atrophic and vaginal pruritus was present. The blood count was normal.

Psychiatric Examination.—The patient was anxious, nagging and obsessive. She was overprotective of her daughter and resentful of her husband's failure, blaming him for ruining her voice career. The patient suffered from insomnia and had had no sexual intercourse with her invalid husband for more than a year.

Treatment.—Diethylstilbesterol, 1 mg. a day, was administered for forty-four days. Benzestrol, 2 to 3 mg. daily, was given for four days.

Outcome.—The patient showed marked improvement until ten days before the close of treatment. She suffered a relapse after the elopement of her daughter.

Case 9.—The patient, aged 58, had experienced the menopause eight years previously.

History and Physical Examination.—The patient's blood count was normal and she appeared to be in good health but complained of burning of the gingivae and mucous membranes. The condition had been present for one and one-half years and was attributed by the patient to the use of artificial dentures.

Psychiatric Examination.—The patient was anxious and tearful about the war and her relatives in Europe. She suffered from insomnia and cancerphobia. She was married but made no data available.

Treatment.—Ringer's solution was injected daily for eight days, followed by Benzestrol in doses of 2 to 3 mg. a day for forty-two days. At the end of this period, the dose was reduced to 1 to 2 mg. daily and the therapy was continued for an additional fifty-two days. Estradiol benzoate, 10,000 rat units a week, was administered for ten weeks.

Outcome.—There was relief for one day after the first injection of Ringer's solution and slight improvement during the treatment period. This improvement was followed by regression, and the patient suffered a severe relapse when her son was inducted.

Case 10.—The patient, aged 58, had experienced the menopause six years previously.

History and Physical Examination.—For six months the patient had suffered from burning of the tongue, gingivae and mucous membranes. These symptoms followed her acquisition of partial dentures and the induction of her son.

Chronic nephritis was present. The blood count was normal.

Psychiatric Examination.—The patient was anxious about her son in the army and tearful and vindictive regarding her domestic life. Although she was frigid and for years had had no sexual intercourse with her invalid husband, whom she loathed, she was obsessed with the idea of cleanliness and used douches three times a week. She was unemployed and suffered from cancerphobia.

Treatment.—Ringer's solution was injected weekly for eight weeks. Estradiol benzoate, 10,000 rat units a week, was given for six weeks, and Benzestrol, 1 mg. daily, was administered for thirty-seven days.

Outcome.—There was improvement after injection of Ringer's solution and slight improvement during estrogen therapy. A marked alleviation of symptoms occurred after the patient obtained employment.

Case 11.—The patient, aged 54, had experienced the menopause six months previously.

History and Physical Examination.—The patient complained of a bad taste in her mouth and dryness and burning of the tongue, gingivae and mucous membranes over a period of ten months. She attributed her symptoms to the acquisition of a partial denture, which had been remade several times. The patient was in good health, and her blood count was normal.

Psychiatric Examination.—The patient was rigid, precise and obsessive. She was a puritanical spinster with an obsession regarding genital cleanliness. Her tension had increased over a period of eight years. She suffered from insomnia and anxiety concerning her livelihood. The onset of her symptoms was coincident with her loss of employment.

Treatment.—Benzestrol was administered in 1 to 2 mg. doses daily for sixty-five days. Injections of 10,000 rat units of estradiol benzoate were given weekly for nine weeks.

Outcome.—There was slight improvement followed by regression before completion of the treatment. The patient's symptoms became negligible after she obtained employment.

Case 12.—The patient, aged 60, had experienced the menopause thirteen years previously.

History and Physical Examination.—The patient attributed the boring sensation and dryness of her gingivae and mucous membranes over a period of two months to her full upper and partial lower dentures.

The patient had had a hysterectomy thirteen years previously and had suffered from psoriasis since her youth. The blood count was normal.

Psychiatric Examination.—The patient was a chronic worrier, slightly depressed and asocial. Her mouth condition became worse when she was emotionally upset. She was reticent but reported frigidity with overt marital strife.

Treatment.—Benzestrol, 1 to 2 mg. daily, was administered for ninety-one days.

Outcome.—The patient's improvement fluctuated according to her degree of anxiety. The condition was not improved at the close of the treatment.

Case 13.—The patient, aged 58, had experienced the menopause eight years previously.

History and Physical Examination.—The patient's burning and raw sensation of her tongue, gingivae and oral mucous membranes over a period of nine months were attributed to the extraction of her teeth. She wore partial lower and full upper dentures.

Hypochlorhydria was present. The blood count was normal.

Psychiatric Examination.—The patient was dissatisfied, nagging and friendless. She was frigid and hated sex, and was unhappily married to an invalid. She had forced her husband to remain in the city because of her mouth symptoms. The patient suffered from insomnia.

Treatment.—Petroleum ointment was applied for two months as a placebo, followed by vitamin therapy and local application of estrogen ointment.

Outcome.—The patient was observed for one year. No improvement was noted.

Case 14.—The patient, aged 68, had experienced the menopause twenty years previously.

History and Physical Examination.—Burning sensations of the tongue, gingivae and mucous membranes had been present for one year. A contributing factor was the patient's habit of sucking her lower teeth. She wore partial dentures.

The patient suffered with pruritus vulvae and her ulcerated cervix had been treated with radium. Hypochlorhydria was present. There was a burning sensation of the hands and feet. The blood count was normal.

Psychiatric Examination.—The patient, who had been widowed ten years previously, was tense and overactive for her age and suffered from cancerphobia. An unpleasant situation had existed in connection with her job for one and one-half years.

Treatment.—No therapy was given. A petroleum ointment placebo was applied for several weeks.

Outcome.—No improvement was seen at the end of the few weeks during which the patient was under observation.

Results

Biopsies.—Grossly, the tissues appeared to be similar to those of a control group of comparable age but with no complaints referable to the mouth. Microscopically, there was no evidence of tissue atrophy in those sections of gingivae examined (Figs. 1-3).

Emotional Status.—Anxiety and emotional conflict were conspicuous in all but one case. This patient was also a deviate in that she was the only patient who had not entered the menopause. The most frequent symptoms were cancerphobia (present in seven out of the fourteen), depression with tearfulness,

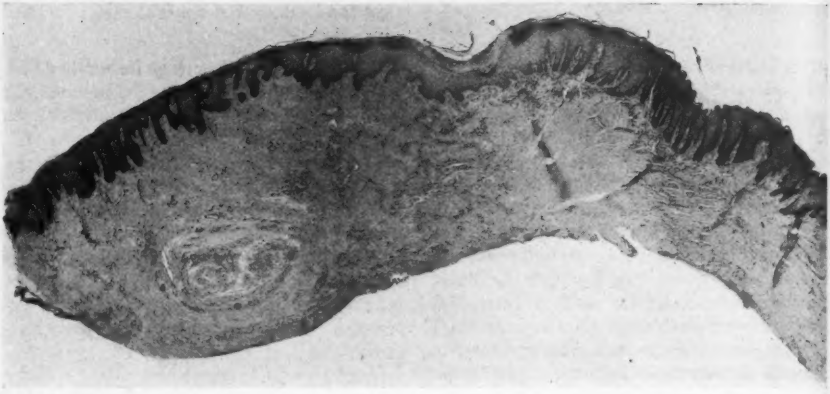

Fig. 1.—Case 14, aged 68. Upper right lateral interdental papilla (X32). The patient complained of "burning" pain in this area. The tissues are of normal appearance

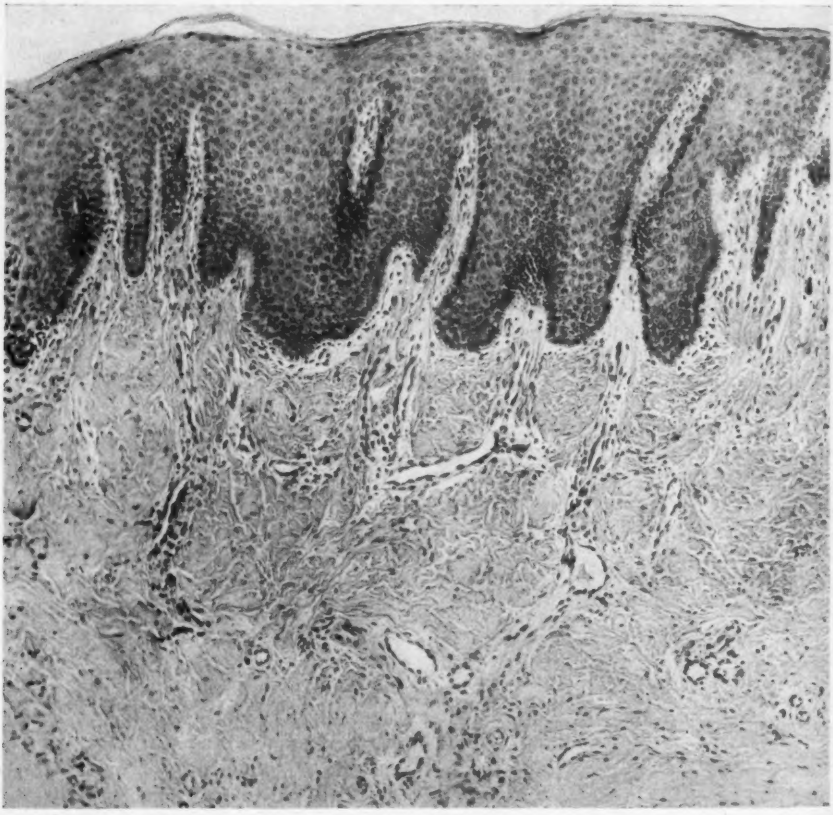

Fig. 2.—Same tissue as in Figure 1, showing enlargement (X150) of alveolar gingiva. There is a normal keratin layer. The epithelium is of normal width and shows no signs of being atrophic. The connective tissue is cellular. Many capillaries are in evidence

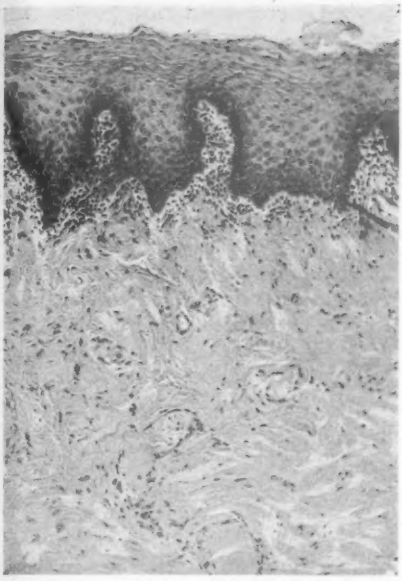

Fig. 3.—Same tissue as in Figures 1 and 2, showing enlargement (X181) of areolar gingivae (mucous membrane). There is a collection of round cells and plasma cells in the lamina propia and many capillaries are in prominence. Otherwise the tissues are normal

hypochondriacal tendencies, chronic excessive worry and marked dissatisfaction with life. Ten of the fourteen cases appeared grossly neurotic. All the patients but one (for whom data were insufficient) indicated a lack of sexual gratification. Five women were widowed, four had husbands who were chronic invalids and were described as too sick to have sexual feeling (of these nine women, four were judged frigid), one was married and frigid and three were unmarried. In the last group two expressed fear and hatred of men, while the third was the exceptional case previously mentioned.

Estrogen Therapy. — Eleven patients received estrogen parenterally or orally. Of these, four showed no improvement. Transient or varying degrees of relief (in some instances dissipated under new emotional stress) was claimed by seven of the patients.

The systemic effect of the estrogen was established by increased cornification in the vaginal and oral smears, and by signs such as uterine bleeding. However, even where some amelioration of the oral symptoms was reported, the estrogen therapy could not be regarded as a factor. In all these cases relapses occurred during the course of treatment. Two patients professed immediate improvement, even before the estrogen could reasonably be expected to act. As this response conveyed an effect of suggestion, controls were set up for these cases.

Placebo.—Injections of Ringer's solution into the arm were given in two cases (9 and 10) before estrogen therapy was started. Improvement was immediate but transient. Case 9 (receiving placebo daily for a week) described complete relief the first twenty-four hours, followed by a relapse. Estrogen intake over a period of 109 days brought an expressed slight alleviation of symptoms, followed by regression. Subsequently, this woman's condition was dramatically aggravated when her son received his induction notice. This patient indicated the most marked cancerphobia in the group, and showed tearful anxiety for relatives in war-ridden Europe. Case 10 received eight weekly injections of Ringer's solution, succeeded by estrogen for thirty-seven days. She reported as much relief from the one as from the other. However, upon obtaining satisfactory employment, the patient stated, "I am much better. Have not had time to think about it."

Psychogenic Nature of Symptoms

The information which was gained through interviews showed a pronounced relation between alleviation of oral symptoms and emotional status. For instance, Case 1 had a remission when a son, about whom she seemed oversolicitous,

came home from the army on furlough. The onset of her original symptoms coincided with his induction. In Case 12 the fluctuation of symptoms appeared to be related to the amount of worry rather than to the kind or the amount of treatment. In Case 5 the oral condition became manifest after the death of the husband. No symptomatic amelioration was indicated with diethylstilbesterol medication despite increased cornification in the smears. When progynon injections were given, the patient claimed immediate relief. Since the smears remained unchanged, this reaction appeared to be a spontaneous response to suggestion rather than a result of treatment. The symptoms returned after the first few injections and were still present at follow-up six months later. Case 11, anxious because of lack of employment, acknowledged slight improvement of short duration, three months after the onset of therapy. More authentic improvement of the mouth condition came some time after medication had been discontinued and was attributed by the patient to the fact that she had a position and was preoccupied with her work.

The most genuine and permanent results were observed in Case 8 who was given five hours of psychotherapy and competent social service help over many months. Her complaint of burning tongue and hoarseness and dryness of the throat followed a year of concern over her husband, a chronic cardiac invalid. Ambitious for a singing career, she attributed her frustration to his physical failure. The hoarseness seemed to be a hysterical manifestation to which she could further ascribe her lack of success as a singer. Medical history disclosed atrophic uterus and vagina, vaginal pruritus, varicose veins and arthritis. The patient was obsessively neat about her home, and over-protective of her 24-year-old daughter. During discussion of these problems, there was marked improvement of the oral disturbance. A relapse occurred ten days before endocrine therapy was discontinued, coincident with her daughter's elopement. With the protracted aid of a social worker, she was finally able to accept the marriage and to consent to a reconciliation, whereupon she experienced relief from her oral difficulties.

No attempt was made to gain deeper insight into the psychogenic nature of the symptoms or the underlying character structure of these fourteen cases. The goal was merely to determine whether or not emotional factors were involved. It seems apparent that the latter were more significant in determining the clinical course than was the estrogen therapy.

Discussion

Three studies, reported in the literature, are of interest in the present discussion.

Richman and Abarbanel[9] studied twenty-five climacteric cases, some of whom complained of burning of the mouth or flatness of taste. Objectively, they showed atrophic changes in the oral mucosa varying from a pale, anemic mucosa to one with grayish white areas and gingival bleeding. After injecting estrogen (dissolved in sesame oil) into the oral mucosa, these writers state that the normal bright pink color returned, the bleeding stopped and in some cases the subjective symptoms disappeared. However, as the injection of oil into the oral mucosa is sufficiently painful to account for numerous possible emotional responses, the disappearance of the subjective symptoms might well be a product of suggestion rather than of medication. Accompanying this report were photomicrographs of purportedly atrophic gingival and vaginal mucous mem-

9. Richman, M. J., and Abarbanel, A. R.: Effects of Estradiol, Testosterone, Diethylstilbestrol and Several of Their Derivatives upon the Human Oral Mucous Membrane. J. A. D. A. 30:913, June 1, 1943.

branes which the authors declare demonstrated the similarity between the two, and photomicrographs showing the recovery of these tissues after estrogen therapy. These sections were tangential and not convincing. Moreover, while the symptoms described in some of the cases resemble those in our series, we found no clinical evidences of atrophy. Neither did we find microscopic evidences of atrophic oral mucous membranes. (Figs. 1-3.)

Nathanson and Weisberger[10] studied thirty-eight cases of leukoplakia buccalis with associated symptoms of burning and dryness of the mouth. Not all had observable lesions. Of twenty-five women, seventeen were in menopause, four were premenopausal with menstrual irregularity and four were young women with amenorrhea secondary to castration. The authors stated that treatment with estrogen resulted in complete disappearance of lesions in 42 per cent, marked improvement in 39 per cent and no improvement in the remaining 19 per cent. Maintenance doses were usually needed to prevent regression.

In both of these studies the implication is that the symptoms are related to sex hormone deficiency. But in both the psychologic status (an important factor in evaluating therapy in problems involving the menopause and the use of sex hormones) was not considered. Marked changes in oral and vaginal tissues will follow the stimulative effect of estrogen therapy, even in normal women. Thus, the inference that sex hormone deficiency has a causal relation to the symptoms is not valid if based solely on the microscopic appearance of the tissues.

Hart,[11] in reviewing twenty female psychiatric patients whose sex life was studied to some extent, found frigidity or rejection of sexual pleasure and satisfaction. Cacogeusia, or foul, disagreeable taste in the mouth, was reported in all the cases. This writer concludes that "many women, particularly when suffering from dental, nasal, or pelvic disorder, may complain of pronouncedly disagreeable taste in the mouth when their sex life is frustrated and void of any pleasure. In this way, accentuation of this symptom may give an additional symptomatic indication of the rejection of sexual life."

The problems presented by the type of patient described in the present report are of special interest to the dentist. The hypochondriacal tendencies displayed and the usually refractory response to therapy make these persons difficult and unsatisfactory patients. It is significant that in nine cases responsibility for oral discomfort was placed on some treatment received at the hands of a dentist; for example, dentures, fillings, extractions. Likewise, it is not uncommon in dental practice to hear expressions of dissatisfaction with dentures that are functionally adequate (although it is frequently admitted that their removal relieves the burning only slightly), and to receive insistent requests for reconstruction. The patient appears to seek justification for her ills in the form of a tangible cause in order that direct measures may be demanded for overcoming them. If the dentist indulges this desire (by supplying new dentures, for example) without evidence of necessity, the patient may feel temporary relief as a result of the suggestion of hopefulness implied in a new treatment. However, in the long run, such attempts are misdirected and palliative at best; they weaken the patient's confidence in doctors generally and create unnecessary expense. These patients are not good candidates for deep, lengthy psycho-

10. Nathanson, I. T., and Weisberger, D. B.: Treatment of Leukoplakia Buccalis and Related Lesions with Estrogenic Hormone. New England J. Med. 221:556, October 12, 1939.

11. Hart, H. H.: Bad Taste (Cacogeusia). Arch. Neurol. & Psychiat. 39:771, April 1938.

therapy; but they can be aided by brief psychotherapy, by the social service approach or by consultation with an understanding physician or dentist.

Summary

Fourteen menopausal women (one exception) with orolingual pain and burning were studied by oral and vaginal smears, by biopsy of the oral mucosa and by psychiatric interview. Eleven were given estrogen therapy, and two were given placebo consisting of injections of Ringer's solution. Although the estrogen had a systemic effect, as shown by the epithelial oral and vaginal smears, it was not effective in dispelling the symptoms. Psychic factors appeared to have an etiologic bearing in all instances, as well as a therapeutic value in those cases where symptomatic relief was noted. This type of orolingual pain, or idiopathic glossodynia, seems to be primarily a psychogenic syndrome occurring chiefly in menopausal women who suffer from emotional conflict, sexual maladjustment and, frequently, cancerphobia. — *630 West 168th Street.*

CURRENT PROBLEMS CONFRONTING MEMBERS OF THE DENTAL PROFESSION: A MESSAGE FROM THE PRESIDENT

Sterling V. Mead, D.D.S., M.S., B.S., Washington

The problems now confronting American dentistry present a challenge that we have seldom been called upon to face. Extension of dental service is still the outstanding problem requiring the united effort of all of our members in every way to work out a solution. We should not be content with the knowledge that American dentistry is the best in the world; we should strive for extension of more efficient dental service.

The legislative program of the American Dental Association is practical and sound. We should exert our best efforts in aiding in its adoption. More is needed, however, than just the adoption of our program, as we must help in the extension of good dentistry. Compulsory plans such as the Wagner bill must be defeated if our program is to succeed when it is adopted. Now, more than in any other period, is the time for dental and medical understanding and cooperation. Our paths lie in the same direction. Cooperation, however, has two sides. The way to defeat radical legislation is not through a lobby and political maneuvers, but by giving the public a better plan for preventing dental defects and extending good dental service.

One wonders what those who look with favor upon compulsory plans would do in any organization such as the Army, the Navy, the U. S. Public Health Service, the Veterans Administration, etc., without the aid of organized dentistry to fight for rights and increased efficiency. It is high time that we understand the abuses of power by certain groups in the services and obtain for dentistry that which will make it most

efficient. Dental service should be for the benefit of the patient and not just a means of attaining rank for officers.

Criticisms of Dentistry

How many of the following criticisms are justified?

Dentists have lulled themselves into a feeling of complacency and false security.

Relatively few seek to improve themselves and the service which they give to the public.

Often the fees are not commensurate with the quality of service rendered and reflect upon the profession as a whole.

Educational practices and teaching methods for patients are conspicuously absent in the average office and practice.

While it is true that dentists sell professional service and not a specific commodity or merchandise, they must parallel business to the extent of selling themselves to the public by inspiring confidence, rendering excellent and skillful service, charging in proportion to the value of the service, and maintaining clean, modern and orderly establishments.

All too frequently dentists, in conversation with their patients, are too willing to criticize or to reject newer theories and technics developed by responsible members of the profession. Such an attitude destroys public confidence. Dentists should have an open mind and should progress in their thinking and planning.

The dental care given to children is poor.

A small percentage of dentists are allowed to continue practices that cause dissatisfaction with the public and thus create a demand for compulsory methods.

The dental profession has failed to promote a research plan with the medical profession for future teaching and for the establishment of a complete plan of medico-dental cooperation.

The incomes of some dentists are low.

Some dentists fail, through lack of funds or initiative, to keep up with practical dentistry and newer methods.

Some dentists at different periods are not able to obtain enough patients to keep them busy.

Laboratory problems are unsettled.

Many dentists are not concerned with the economic as well as the scientific aspects of dentistry.

The ratio of dentists to the population in the various states is not equal.

Dentistry for army and navy personnel has been prevented from attaining its full efficiency.

There are trends toward federal control of dentistry by a group of federal bureaucrats.

The dental profession fails to realize that what happens to medicine will happen to dentistry.

Children's Dentistry

The general lack of interest of many dentists in the oral health of young patients is noteworthy and points to the need for a more constructive and intelligent attitude. Much has been said about this professional dilemma in the literature and otherwise, by interested members of the profession, but unfortunately too little is being done about it.

How many general practitioners devote a just proportion of their professional time to children? If not, why not? The children of today are the men and women of tomorrow and for that reason alone should receive full and proper recognition from all dentists, especially the general practitioner. Can you conceive of a physician or a general practitioner of medicine who did not regard the health of children as a serious responsibility? Does he differentiate between the extent of service for children and adults?

There is a feeble effort on the part of many to overlook what the profession has failed to accomplish in the care of dental health for children. Is it not the responsibility of the dental profession

to emphasize dentistry for children and really do something about it? The marvelous progress made by our profession only emphasizes the need for more and better children's dentistry until such time as better preventive and remedial measures are available. There is not sufficient manpower in dentistry to rehabilitate the millions of young patients through restorative methods alone. Preventive dentistry must be practiced, and research encouraged.

It is an open secret that general practitioners as a whole prefer to devote their time to adult practice. Obviously, lowered remuneration is one of the major reasons why so little attention is paid children. This in itself is a challenge to organized dentistry.

A high type of service to an intelligent public presages an increased appreciation of the dentist's services which can very well be translated into adequate reward, professionally and financially. The intelligent parent will appreciate careful and painstaking service for his children. Such a parent can and will understand that the dentist who provides that care is entitled to the same rate of compensation for his time and service, regardless of whether the patient is a child or an adult.

As a concrete step in this direction, I would recommend that every state society appoint a special committee on children's dentistry. Surely the problem of children's dentistry is so big that a committee would have difficulty in finding time for the consideration of any other subject if it covers this field well.

Dental and Medical Cooperation

During the past twenty years especially, there has grown an intimate spirit of cooperation between medicine and dentistry in civil practice. In most communities, there is complete understanding of interrelated problems and the true spirit of cooperation.

Because of the utter lack of vision and understanding, in the Army and Navy especially, of the necessity of autonomy of both professions and a spirit of cooperation, dentistry has been greatly hampered and prevented from attaining its full efficiency.

During World War II, the experience of many dental officers who had occasion to run into the unfair bureaucratic authority of some overzealous member of the medical profession and the attempt of Harvard and more recently Columbia to relegate dental education to a subservient role to medicine have caused some dentists to feel that they have some grievance against physicians. This attitude is wrong, in that it reflects inaccurately the attitudes and cordial relationships of most members of both professions, and should not be allowed to develop.

The relationship of dentistry to medicine should be recognized as a genuine partnership in the service of the public. Midgley[1] has aptly stressed the timeliness of this problem in a survey of "The Medico-Dental Relationship," and it is time to follow through with a program of this nature.

With a century of independent education, with separate literature, state laws and state boards, and with a predental education on a parity with that of medicine, it is natural to expect a jealous guardianship of an autonomy which has resulted in world leadership. It is urgent that the profession awaken to a knowledge of some of the academic attempts that have been and are being made to merge dentistry with medicine. These attempts do have, however, a significance that the profession cannot well afford to ignore, since they indicate that the dental profession and especially dental teaching are being subjected to a critical examination by philanthropists, politicians, educators and others outside the fields of medicine and dentistry.

1. Midgley, A. L., The Medico-Dental Relationship. *Rhode Island M. J.* 29:114-116 (February) 1946.

The acceptance of the focal infection theory and the knowledge that the mouth is an important factor in the health service have made it apparent that neither the dental profession nor the medical profession is complete in itself.

Why must the individual genius, the cumulative knowledge, the energy and experience, the organized power and influence which have accrued to both professions still be confined to separate channels, when one strong current of complete cooperation would carry them forward to regions of broad vision and fine achievement and greater fields of public service? This would add great power to defeat the aims of misguided intellectuals who would federalize professional service despite the obvious tendencies of services to deteriorate under such plans.

Practical knowledge has shown that it is neither necessary nor practicable for the physician to be a dentist or the dentist to be a physician. The public will continue to obtain best service by an independence of the professions and a mutual respect.

The time would seem propitious to start a critical research plan and analysis of the educational plan best adapted to serve the needs of the public. As a concrete step in this direction, I would suggest a committee of five outstanding dentists and five outstanding physicians with a neutral layman of proved capacity as chairman to undertake a plan of this nature with the thought of studying and settling differences, real or imagined, and securing complete cooperation between the two professions.

Dental Veterans

The veteran has every right to expect much from the American Dental Association, and it is apparent in many localities that much more could have been done before the end of the war by men at home than was accomplished. The veteran must realize that he should be an active participant in the affairs of the American Dental Association and that he should fight for improvements rather than be content with criticism. He should not be unmindful of what has been accomplished for his benefit in the Selective Service, whereby dentists became officers instead of privates, and he should appreciate improvements in the U. S. Public Health Service, the Veterans Administration and the Navy, and the important work being carried on for a rational dental program for extension of dentistry and the defeat of radical compulsory plans.

Some localities have failed to provide space and at least temporary quarters for returning veterans and to provide for the notification of old patients and the obtaining of new ones. Provision should be made for running advertisements in all local papers to the effect that, if anyone is unable to get a dentist, he should contact the secretary of the dental society. The secretary will distribute the patients among returning veterans. Also feature stories should run locally about the war efforts of the dental veterans.

The veteran has reason to be critical of the way war surpluses have been managed, but this bungling has not been the fault of the American Dental Association. In fact, the American Dental Association is largely responsible for obtaining the amendment granting priority to veterans.

Because of the known injustices, hardships and unnecessary blunders of the military in assimilating thousands of reserve dentists during the last war, an honest effort should be made to correct these inequalities now and also to provide more efficiency in the future. There should be a more thorough evaluation of the qualifications of a dentist before commissioning him in the reserves of the armed forces. A fairer system of granting initial rank would be based upon years of experience, ability, training, age

and standing in the profession. For the benefit of personnel, there should be a recognition of the various specialties. A fairer system of promotion is needed in which consideration is given to a dentist's proven ability, industry, responsibility and leadership. It has been asked, shall promotion be based upon senility or efficiency? A more equitable number of promotions should go to the Reserve Corps, and an equitable system of demobilization should be inaugurated.

Investigation should be made of the method of making awards of merit. The man on the fighting front should receive the greatest consideration.

Long-range planning for education and the needs of the services should be sought.

I, therefore, recommend that a reserve officer be placed in the Surgeon General's Office of the Army, in the Bureau of Medicine and Surgery in the Navy, and in the Veterans Administration. These men will have the opportunity to look after the interests of the reserves in time of war and of the reserves and veterans in peacetime. It is also recommended that each state society establish a veterans' committee.

Dental Laboratories

The dental laboratories are a definite adjunct to the dental profession. There should be a true spirit of consultation and cooperation between dentistry and the laboratories. Autonomy is self-evident, but many mutual problems may be solved by closer affiliation.

The laboratories should set up their own organizations, but it is apparent that there is need of a meeting ground within the framework of the American Dental Association for consideration of mutual problems, such as education, standards, etc.

The profession and the laboratory should be equally concerned with the maintenance of both professional and technical standards. How these standards can be raised and maintained is a subject to be reviewed jointly by dentistry and the dental laboratories. Once the two groups have recognized these problems and have agreed upon which method offers the best solution, both groups should then work together to achieve the end mutually agreed upon.

The G.I. training programs in every state now have students in laboratories or various types of schools. Trade schools teaching prosthetic dentistry are spreading all over the country. Do these schools have the facilities for doing a good job? One can readily understand the many dangers involved and the necessity of control of the dental laboratories as well as the control of dental technicians. If schools for dental technicians are necessary, let us set up a standard so that the student will have some assurance and will know what to expect for his investment of time and the government investment in his training.

The older men of the professions will remember that after the last war a great many veterans were in some instances given an indefinite and inadequate training in dental prosthesis by schools, commercial laboratories and individuals, all paid for out of the veterans' fund. The selection and training of these veterans was indiscriminate, unregulated and poorly supervised so that later, when the depression came, these men became a glut upon the market and often produced indifferent dental service for the dentist and the patient. Remembering this, the Veterans Administration two years ago approached the American Dental Association and asked that certain minimum standards be established for training of dental technicians. These standards were compiled and published April 27, 1946, by the Council on Dental Education. Now, throughout the country, schools that are recognized by the states where they have political influence are springing up overnight, and the federal government has not done

anything because it apparently is not cognizant that standards have been established.

International Dentistry

The international picture should be kept carefully in mind. It is important to realize that, in dentistry as well as in other affairs, our relationships can no longer be considered only national. They are international in their importance.

Most of the countries of the world have fallen victims of the German social plan of compulsory and federal plans, and have seen their liberties taken from them, with degeneration of dental service. They are looking to this country for leadership. We must recognize clearly our duty in international relationships and encourage free interchange of ideas and facilities.

The medical, dental and legal professions of any country are only a small segment of its population, but, because of their daily contacts, they can exercise a tremendous force toward understanding. Because of this, they become an important influence in developing international understanding and contributing toward world peace. We must become better acquainted with one another. We must exchange ideas and technics. We must have sympathy and appreciation for each other's work and problems, and we must make individual efforts to express all this. This is not a one-man job. It is the responsibility of every individual professional man. Toward this end, international conferences and meetings should be encouraged and arranged.

Population-Dentist Ratio

The unequal distribution of dental services is one of the great obstacles to dental health in the United States. It is very apparent that social economics as well as climatic factors are largely responsible. Regulated migration or transposal of dental offices to areas in need of dental service is not only impractical but contrary to all of the American principles of free trade, liberty and the pursuit of personal happiness.

Alleviation of adverse population-dentist ratios under present manpower conditions is utterly impossible. Dental education under present economic conditions is very restrictive because only certain privileged groups are able to acquire expensive dental training. There are thousands of highly intelligent young men mentally and morally qualified who would be willing and eager to acquire a dental education if economic barriers were removed. It would seem logical, therefore, that scholarships be provided for these young men, the recipients to be selected on the basis of their mental, practical and moral qualifications. These men would receive training in our universities in consideration for which they would agree, under terms that would effectively bind them, to practice for a given number of years in the areas from which they came.

It might be well for communities which need dentists to consider the advisability of appropriating money for scholarships for dentists, who will return to these communities after graduation. The American Dental Association should be interested in cooperating in a plan of this kind. Another suggestion in this direction would involve what might be considered a subsidy, although in actuality it would be a guaranty of income at certain levels under prescribed conditions which should include the provision of adequate dental service to groups of specified sizes in areas justifying such need.

There will be an unequal distribution of dental services until a more equitable provision is made for attracting dentists to less favored localities. I contend that the veterans' fee schedule should be the same throughout the region, and that it should not be revised for certain localities as it is always revised downward; a man in an unfavorable or low income

location, although he may not need as much money for living expenses as would be the case in more favorable places, does need an additional inducement to be in that locality, and I do not see any reason why he should not receive as much as anyone else.

Publicity

In recent years there has been a tendency on the part of many dentists to overemphasize the important biologic aspect of dentistry and to neglect the importance of mechanical science. The public needs to know more about dental service and the problems involved in its extension.

Every state should have a full-time secretary of a public relations committee. These committees should be closely interrelated with the Bureau of Public Relations in the Central Office, using every means to extend dental education to the public. State dental journalism should be encouraged and advanced with all possible aid.

The greatest source of distribution of information is the dentist himself, and there should be a systematic campaign periodically to supply him with material and suggestions for talks to his patients on the care of the mouth and dental problems, as well as the dental program of the American Dental Association, extension of the dental service, compulsory plans, etc. The dentist should, above all else, convince the patient of the desirability of good dentistry.

Most of the dental health information on radio time is sponsored by commercial concerns and not by the dental profession. The dental profession should make an effort to capture the imagination of the layman as medicine has done, through magazine and newspaper space and radio time. Are we satisfied that enough is being done to obtain national magazine space and radio time?

Further Suggestions

To build better public appreciation, dentists should observe carefully at all times the deportment of themselves and their organizations.

Each dentist should be zealous of his right and privilege to vote in his society and be instrumental in his community in enlightening the public regarding the problems involved. Dissemination of scientific data to the public should be carried on in a vigorous and constructive manner.

Continued cooperation with, and assistance to, hospitals, physicians, nurses and pharmaceutical groups will be very much in the public interest. Veterans' problems, particularly as they relate to returned dental officer personnel, will call for great effort upon our part.—*1149 Sixteenth Street, N. W.*

Dentistry Tomorrow.—Gone is the day when the individual dentist can restrict his work to his small dental operating room, with a narrow perspective of his confines. The dentist of tomorrow must have a broader scientific and public health background. The profession must provide service for all rather than for only a few. The dentist is a part of the great pattern of public health care. Dental public relations of tomorrow must be faced realistically and without prejudice, so that dentistry will assume its responsibility as one of the leading health services.—*Dentistry: An Agency of Health Service. Malcolm W. Carr. New York: Commonwealth Fund, 1946, p. xxiv.*

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HAROLD HILLENBRAND, D.D.S., *Editor*

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EDITORIALS

REGIONAL DENTAL JOURNALS: NEXT STEP IN DENTAL JOURNALISM

THE deficiencies of dental journalism have been discussed for more than a generation, and one of the few problems on which there is almost universal agreement is that there are too many dental publications. This does not mean that there is an unwanted abundance of sound professional literature. It does mean that journalistic effort is now being diverted into so many channels that a strong current of professional literature cannot be fully sustained in all parts of the country. The multiplication of journals, reviews, digests and bulletins indicates a worthy interest in supporting various activities and enterprises, most of which are purely local in character. But this very restriction of scope leads immediately to the limitation of resources, both literary and financial. The end result is that many starve and only a few prosper.

To remedy this condition, there are many who advocate the establishment of well-placed regional dental journals. Under such a program, states that have a traditional or geographic association combine their resources to produce a single, stronger publication. Access to the pages of a regional journal is worked out on a basis satisfactory to the participating groups. The cost of publishing extensive, well-illustrated scientific articles is shared, and the waste of endless reprinting is eliminated. An adequate advertising program can be based on increased circulation and reader interest and not on lesser appeals. The shortage of good material for publication is lessened, and the editor can be provided with essential technical assistance. The regional journal also provides an effective forum for the discussion of regional problems. This is important since planning for health increasingly involves a consideration of those social and economic differences that are peculiar to a given area.

The tradition and pride which the individual state or community now finds in its own publication are, of course, obvious obstacles to the development of the regional program. Unless members of such units are themselves willing to defray the

cost of an expanding journalism program, their growing needs cannot be met satisfactorily by continued independent publication. Local needs and traditions can be served by the publication of small bulletins in which the programs and personalities of limited local interest are discussed. This arrangement provides for an exchange of topical information so essential to the well-being of an organized group. It also permits the larger part of the region's resources to be used for making an actual contribution to the literature of the profession.

North-West Dentistry is the only regional dental journal in existence at the present time. Its success as a publishing venture indicates that it has met the needs of the participating states: Minnesota, North Dakota and South Dakota. In New England,[1] there is renewed discussion of regional publications, and plans are actually under way for the establishment of a New England dental journal. Last month, the Second District Dental Society of New York announced that it would discontinue publication of its own official organ in order to support the enlarged journalism program of the state dental society. This program might well be undertaken by the state dental society "with the ultimate intention of coordinating its own journal activities with those of near-by states and eventually forming a high quality regional journal."[2]

The profession will watch these activities with interest in the hope that out of them will come a more coherent and more forceful dental journalism.

END OF AN ERA:

HARVEY J. BURKHART,

1864—1946

AN ERA in dentistry ended when Harvey J. Burkhart died on September 22 at the age of 83. He was, perhaps, one of the last of that thin rank of pioneers who was able, in the early and formative days of the profession, by sheer force of personality to effect the essential compromises that were indispensable to the unity of the profession. His unique talent for administration helped to mold fragmentary groups into a unified, national organization. His knowledge of historic precedent and situations enabled him to work toward the objective that he always held before himself: the advancement of the dental profession, not only in the United States but throughout the world.

Dr. Burkhart became interested in international dentistry early in his long career. In 1904, he helped organize the Fourth International Dental Congress at St. Louis and also served as its president. In 1915, he was a delegate to the International Dental Congress in London. Shortly before his death, he was named honorary president of the *Fédération Dentaire Internationale*. Through his work as director of the Eastman Dental Foundation, dental clinics were established abroad at London, Paris, Berlin, Brussels, Rome and Stockholm. His influence was world-wide in extending the prestige of American dentistry.

1. *J.A.D.A.* 33:1224 (September 15) 1946.
2. Editorial. For Better Dental Journalism. *J. 2nd Dist. D. Soc. (N. Y.)* 32:272 (October) 1946.

In dental organization, Dr. Burkhart established a record that has no parallel in American dentistry. Early in his career his abilities were recognized when it was stated that "few if any in the dental profession possess the marked executive ability in the promotion of dental society work" that Dr. Burkhart did.[1] He served as president of the Eighth District Dental Society of New York and as president of the Dental Society of the State of New York. He was president of the National Dental Association in 1898-1899 and was instrumental in organizing the present American Dental Association. Since 1913, he has been a member of the Board of Trustees of the American Dental Association, holding such an office longer than any other dentist. As director of the Rochester Dental Dispensary, later the Eastman Dispensary, Dr. Burkhart administered George Eastman's three million dollar benefaction. Since 1899, he was a member of the New York State Board of Dental Examiners and always displayed a lively interest in the progress and standards of dental education.

Such formal documentation, however, is merely a cursory examination of the many achievements in his long career. His real influence, which will extend far beyond his own time, is to be found in the notable assistance that he gave to dental organization, in the standards he fought for in dental education and in the impetus he gave to international solidarity and understanding. These are the things for which this pioneer will be inscribed in the history of dentistry.

1. Koch, C. R. E., *History of Dental Surgery*. Chicago: National Art Publishing Company, 1909, p. 650.

Sterling V. Mead
President
1946-1947

Sterling V. Mead, President of the American Dental Association, was born October 16, 1888, at Hutchinson, Kan. He attended the public schools and the Salt City Business College in that city. He was graduated in dentistry from George Washington University in 1914, later obtaining his bachelor and master's degrees in science from Georgetown University. In 1929 he served as president of the District of Columbia Dental Society and, in 1932, as Vice-President of the American Dental Association. For several years before assuming the office of President-Elect, he served as chairman of the Committee on Legislation

H. B. Washburn
President-Elect
1946-1947

H. B. Washburn, new President-Elect of the American Dental Association, was born June 8, 1884, at Red Wing, Minn. He was graduated from the Dental School, Northwestern University, in 1905 and entered general practice in Zumbrota, Minn. In 1914 he went to St. Paul, where he practices general dentistry at the present time. He has been president and secretary of the St. Paul District Dental Society and president of the Minnesota State Dental Association. In 1926, he was chairman of the Full Denture Section of the American Dental Association. In 1940, he was elected a member of the Board of Trustees from the Tenth District and has served two terms

REPORT OF THE ACTIVITIES OF THE 87TH ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION

THE House of Delegates, meeting for the first time since 1944, held its eighty-seventh annual meeting at Miami, Fla., on October 14-16 and voted to return to a regular scientific session in 1947 at Boston after a wartime interval of six years without a full-scale meeting. This meeting will be held in conjunction with the tenth meeting of the International Dental Congress. The House of Delegates also transacted a mass of business which had accumulated in the two-year period. A full report of these activities will appear in a future issue of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

1. ELECTION OF OFFICERS AND TRUSTEES

At the end of the session, Sterling V. Mead assumed the office of President to succeed Walter H. Scherer, who had held the office for a period of two years. H. B. Washburn, St. Paul, retiring Trustee, was made President-Elect in a contest with Fred J. Wolfe, New Orleans. E. B. Penn, Miami, who served during the meeting as chairman of the Committee on Local Arrangements, was made First Vice-President. B. B. McCollum, Los Angeles, and Malvern D. Huff, Atlanta, were named Second and Third Vice-Presidents, respectively. Roscoe H. Volland was re-elected as Treasurer, and Harold Hillenbrand was named as General Secretary to succeed Harry B. Pinney, who retired from the position after nineteen years of service with the Association.

Board of Trustees

Eight members were elected to the Board of Trustees in order to fill terms that expired in 1945 and 1946. Henry Hicks, Greenwich, Conn., was returned for a second term in the First Trustee District. In the Second Trustee District, William McGill Burns, Brooklyn, was elected. He succeeds Percy T. Phillips, New York City, who served for the short interval after the death of Harvey J. Burkhart. In the Sixth District, Robert P. Thomas, Louisville, was named as Trustee in a contest with E. C. Hume, Louisville. He succeeds Howard E. Summers. To succeed Carlos H. Schott, Cincinnati, J. B. Carr, Indianapolis, was named as Trustee in the Seventh District. C. S. Foster, Cedar Rapids, Iowa, was elected as Trustee of the Tenth District to succeed H. B. Washburn, who became President-Elect. Russell A. Sand, retiring Trustee of the Eleventh District, was succeeded by Fred S. Shandley, Seattle. Willard Ogle, Dallas, was elected as Trustee from the Twelfth District to succeed Fred J. Wolfe. David W. McLean, retiring Trustee of the Thirteenth District, was succeeded by R. C. Dalgleish, Salt Lake City.

2. APPOINTMENTS TO STANDING COMMITTEES

The following nominations by the Board of Trustees for membership on standing committees of the Association were confirmed by the House of Delegates:

Judicial Council: Robert L. Heinze, 1951; R. G. Keyworth, 1950; *Committee on Legislation:* William H. Griffin, T. J. McDermott and W. J. Jones, 1950; N. A. Arganbright, Paul E. Jones and W. D. Everhard, 1949; *Committee on Library and Indexing Setvice:* John E. Gurley, 1950; E. E. Haverstick, 1949; Hilda Rankin, 1949, and Margaret Palmer, 1948, librarians; *Insurance Committee:* J. P. Justin, 1951; A. D. Weakley, 1950; *National Board of Dental Examiners:* D. J. Fitzgibbon, 1951; J. E. John, 1950; Hardy Poole, to succeed N. C. Poer, resigned, 1947.

Membership Committee: Holly C. Jarvis and F. J. Martin, 1951; E. L. Thompson, Craft A. Hopper and Paul W. Zillmann, 1950; Homer Butts, 1948; *Relief Commission:* Thomas Cullen, 1951; L. M. Cruttenden, 1950; J. Russell Mitchell, 1950. *Research Commission:* Daniel F. Lynch, Harry E. Frisbie, Basil G. Bibby, J. L. T. Appleton and P. C. Lowery, 1951; E. Harold Gale, R. H. Volland, Gerald A. Devlin, H. B. G. Robinson and L. R. Main, 1950; *Committee on Patents:* Z. W. Moss, 1951; James Krasnoff, 1950; *Committee on Economics:* H. E. King and H. Trendley Dean, 1951; Harry Strusser, Maurice E. Peters and L. M. FitzGerald, 1950; *Council on Dental Therapeutics:* Paul J. Hanzlik and F. D. Ostrander, 1952; Harry Lyons and Arno B. Luckhardt, 1951; Lester W. Burkett, to succeed Milan A. Logan, resigned, 1948; *American Red Cross:* George A. Coleman, 1949, and B. Lucien Brun, 1948; *Committee on Nomenclature:* James D. McCoy and Harry Lyons, 1950; W. Earle Craig and R. E. Blackwell, 1949; *Committee on History:* J. Ben Robinson, 1951; Warren Willman, 1950; H. L. Faggart, 1949; W. N. Hodgkin, 1948; E. M. Clifford, 1947; *Committee on Dental Museum:* Paul E. Boyle, Virgil A. Loeb and Henry A. Swanson, 1950; Paul Fitzgerald, T. A. Hardgrove, B. O. A. Thomas and W. A. Fennelly, 1949; *Council on Dental Education:* Roy O. Elam, 1949; F. J. Houghton, 1948; J. R. Blayney, 1947; *Council on Dental Health:* Walter A. Wilson, Lloyd H. Dodd and H. K. Willits, 1949; L. M. S. Miner, Hugo M. Kulstad and Leon Kramer, 1948.

Constitutional and Administrative By-Laws: Max E. Ernst, 1949; C. E. Peterson, 1948; *Scientific and Health Exhibits:* E. Horace Jones, 1951; Walter Briggs, 1950; *Committee on Motion Pictures:* R. I. Humphrey, 1951; Russell C. Wheeler, 1950; *Committee on International Relations:* John W. Ross and B. Orban, 1951; Malcolm E. Carr and Don J. Aubertine, 1950.

State Officers' Conference

The State Officers' Conference of the American Dental Association held its first postwar session at Miami and elected the following officers: L. M. Cruttenden, St. Paul, president, to succeed J. E. John, Roanoke, Va.; Robert L. Borland, Los Angeles, vice-president; and H. K. Willits, Reading, Pa., secretary. Among the speakers who addressed the conference were: President Walter H. Scherer, Admiral W. T. Wright, Jr., U. S. Public Health Service, and Milburn M. Fowler, Veterans Administration.

3. GENERAL ACTIONS BY THE HOUSE OF DELEGATES

Two budgets were submitted to the House of Delegates by the Board of Trustees. The first of these had an estimated income of $685,000 for the next year and an estimated expense of $678,000, leaving an excess of income of $7,000. The House of Delegates rejected this budget in favor of one which was out of balance: $685,000 of estimated income against $753,000 of estimated expense. This budget indicates an estimated deficit of $68,000 but will permit vital activities of the Association to expand. A major portion of the additional projected expense was allocated to expanding operations in the Bureau of Public Relations and for the publication of two regular issues of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION each month.

The House of Delegates also voted to establish a retirement plan for full-time employees of the Central Office, with retirement age set at 65 years. The House rejected the establishment of a "means test" in dental programs at the federal level, holding that this right was reserved to the determination of the states. The House authorized the appointment of a War Memorial Committee to plan for the establishment of a permanent memorial for all dentists who died in past wars. The delegates also authorized the continuance of the Washington office of the American Dental Association and created the post of assistant secretary to direct activities in that office. This post will be held by C. Willard Camalier, former chairman of the War Service and Postwar Planning Committee. A standing committee, composed of five members, three of whom shall be veterans of World War II, was recommended by the delegates. The House also approved legislation giving "dentistry full responsibility for dental matters in the armed forces."

A recommendation to establish a Children's National Dental Health Day, proclaimed by the President of the United States, was carried by vote of the delegates. The House ordered that all resources of the Association be used to "hasten the discharge of all dental officers over and above the actual need of the armed forces."

In regard to the suspension of the School of Dental and Oral Surgery, Columbia University, the House voted that "after full consideration of the question" it would sustain the position of the Council on Dental Education. The House of Delegates also recommended to state dental associations the approval of the use of dental hygienists as ancillary aids and urged the promotion of proper training courses for dental hygienists. Other activities of the House will be reported in a later issue of THE JOURNAL.

4. HOUSE HOLDS SERVICES AND PRESENTS AWARDS

At the second meeting of the House of Delegates, held on Monday afternoon, an impressive memorial service was held for those dental officers whose lives were sacrificed during World War II. Those who participated in the memorial program were: President Walter H. Scherer, Admiral Alexander G. Lyle for the Navy, General Thomas L. Smith for the Army, Chaplain W. R. Bryant, U.S.N., Miami Naval Air Station, and Sgt. Richard Wetmore, bugler of the AGF band, Pratt General Hospital, Coral Gables, Fla.

Honor Percy R. Howe

The first honorary award to a living dentist was made at the Tuesday meeting of the House of Delegates when President Scherer presented the 1945 A.D.A. plaque to Percy R. Howe, Belmont, Mass., director of the Forsyth Dental Infirmary for Children, Boston. Dr. Howe, who has been director of the Forsyth Infirmary since 1927, was given the award for distinguished service to dentistry in research and other fields.

W. T. G. Morton Honored

The A.D.A. plaque for 1946 was awarded to memorialize the achievements of W. T. G. Morton, who made the first successful public demonstration of ether anesthesia a century ago on October 16, 1846. The Morton award was made as a part of the Association's Centennial Celebration of this anniversary. A duplicate plaque was presented at the Massachusetts General Hospital in Boston as a part of the elaborate ceremony that was staged in that city to mark the centennial.

Certificate to Mead

A special certificate of appreciation was presented to Sterling V. Mead, new A.D.A. President, for his services as the official representative of the Association on a lecture trip to Mexico. The presentation was made by Dr. Enrique C. Aguilar, Mexico City, secretary of the *Asociacion Dental Mexicana.*

5. AFFILIATED GROUPS HOLD MEETINGS AND ELECTIONS

The American Society of Oral Surgeons, which held its twenty-eighth annual meeting at Miami Beach, installed Glenn J. Pell, Indianapolis, as president to succeed Van B. Dalton, Cincinnati. Other officers elected were: Vernor H. Eman, president-elect, Grand Rapids, Mich.; James R. Cameron, vice-president, Philadelphia; Harry Bear, secretary-treasurer, Richmond, Va.; Van B. Dalton, Cincinnati, and Horace L. Cartee, Miami, members of the Board of Directors.

The establishment of a national certifying board to establish qualifications for the practice of oral surgery was also announced during the society's meeting. Howard C. Miller, Chicago, is president of the new organization, the American Board of Oral Surgery, which will begin holding examinations in 1947. Other members of the board are: Carl W. Waldron, Minneapolis, editor of the *Journal of Oral Surgery,* vice-president; Leslie M. FitzGerald, Dubuque, Iowa, secretary-treasurer; James R. Cameron, Philadelphia, Athol L. Frew, Dallas, Frank B. Hower, Louisville, Aubrey L. Martin, Seattle, directors.

Prosthetics Academy

The Academy of Dental Prosthetists, which held its twenty-eighth annual meeting in Miami Beach, also announced the creation of a specialty board. Members of the new board include: C. O. Boucher, Columbus, Ohio; O. M. Dresen, Milwaukee; B. L. Hooper, Lincoln, Nebr.; I. R. Hardy, Boston; R. H. Kingery, Ann Arbor, Mich.; David W. McLean, San Marino, Calif.; C. J. Stansbery, Seattle; R. W. Tench, New York.

John I. Sloan, Cleveland, was installed as president of the Academy to succeed O. M. Dresen, Milwaukee. Other officers are: David W. McLean, San Marino, Calif., president-elect; I. R. Hardy, Boston, vice-president; I. Lester Furnas, La Jolla, Calif., secretary-treasurer.

Dental Examiners

The American Association of Dental Examiners, which held its sixty-third annual session at Miami, elected the following officers: T. M. Barlow, Bellingham, Wash., who succeeds Paul E. Jones, Farmville, N. C., as president; Henry A. Swanson, Washington, James J. Vaughan, Nashville, and J. J. Clark, Artesia, N. Mex., vice-presidents; R. P. Thomas, secretary-treasurer.

Dental Assistants

The American Dental Assistants Association held its twenty-second annual session and elected the following officers: Margaret Sharp, Jasonville, Ind., president; Sadie Hadley, Beverly, Mass., Katie McConnell, Atlanta, and Steve Ann Mills, Dallas, vice-presidents; Aileen Ferguson, Jamaica Plain, Mass., general secretary; Evelyn Brett, Etna, Pa., treasurer.

6. REVISED CONSTITUTION PRESENTED FOR ACTION IN 1947

A thorough revision of the Constitutional and Administrative By-Laws of the American Dental Association was presented to the House of Delegates for consideration. Under the usual parliamentary procedure, the revision will be considered at the annual meeting in 1947.

The revision was the work of a special committee of the Board of Trustees appointed to study the basic rules of the Association. The committee was composed of H. B. Washburn, C. J. Wright and Harold W. Oppice, chairman. George H. Fox, general counsel, served as secretary of the special committee. The entire text of the new instrument will be presented in a later issue of THE JOURNAL, but a summary of its major features follows:

1. The House of Delegates remains the supreme authoritative, deliberative and legislative body of the Association, with the power to determine policies.

2. The Board of Trustees becomes the managing body of the Association with power to conduct all activities, to establish administrative rules and regulations, to appoint the General Secretary, Treasurer and Editor and to nominate members of all councils and bureau advisory committees for election by the House of Delegates.

3. The General Secretary becomes the "principal administrative officer, directly and solely responsible to the Board of Trustees" for the performance of his duties which include the supervision and coordination of the activities of all councils, bureaus and committees "as regards their specific assignments by the House of Delegates, the Board of Trustees or these By-Laws."

4. The thirty-three special and standing committees that exist at the present time are consolidated into the following sixteen councils: Council on Membership, Judicial Council, Council on Relief, Council on Insurance, Council on Scientific Sessions, Council on History, Council on Dental Education, Council on Dental Health, Council on Legislation, Council on Dental Research, Council on National Dental Museum and Dental Registry, Council on Dental Therapeutics, Council on Federal Government Dental Corps, Council on Dental Trades and Laboratory Relations, Council on International Relations and National Board of Dental Examiners. All councils, except the Council on Dental Education and the National Board of Dental Examiners, shall be composed of five members of the Association nominated by the Board of Trustees and elected by the House of Delegates. All councils have the authority to appoint or employ consultants and advisers to aid the Council members, in

addition to employing administrative personnel.

5. Four bureaus will be established in the Central Office under the direction of the General Secretary. Each bureau except one will have an advisory committee of five members of the Association nominated by the Board of Trustees and appointed by the House of Delegates. The personnel of all bureaus will be employees of the Association. The bureaus proposed are: the Bureau of Statistics, replacing the Committee on Economics; the Bureau of Public and Professional Relations; the Bureau of Library and Indexing Service; and the Bureau of Business Administration.

6. The following new classification of members is proposed: active, life, affiliate, undergraduate student and honorary members.

7. All constituent societies will be chartered by the American Dental Association and, in turn, will have the right to organize component societies.

8. No change is proposed in the arrangement or number of trustee districts, nor is there any alteration of the present method of determining the number of delegates. No provision is made for altering the present method of nominating Trustees except in the case of those trustee districts that are composed of a single state. In this case, a majority vote of the delegates present will provide the only nominee from that district.

9. A Council on Scientific Session is established to "serve as the general program committee for the scientific session." This council will determine the number of general meetings held during each scientific session, prepare a program for each meeting, coordinate the programs of the various sections and establish rules and regulations for governing section officers in the performance of their duties.

10. Provision is made for the selection of a meeting place for the scientific session three years in advance.

11. The following sections are established: operative dentistry; full denture prosthesis; partial denture prosthesis; oral surgery, exodontia, radiology and anesthesia; orthodontics; pedodontics; periodontia; research in basic sciences; practice management; limited attendance clinics; general clinics; scientific exhibits; and dental health education exhibits.

12. Present dues for active members remain at $6 per year with a $5 charge for affiliate members and a $3 charge for undergraduate student members.

SERVICE FOR DENTAL CORPS OFFICERS CUT TO 24 MONTHS

The service requirement for reserve officers in both the Army and Navy Dental Corps has been reduced to twenty-four months effective November 1. Previous minimum service in both branches of the armed forces was thirty months.

The War Department announced that its new separation policy applies particularly to officers in Category V of the Medical Department—those who have requested early relief from active duty —and includes graduates of the Army Specialized Training Program.

Officers in the Army Veterinary Corps, the Sanitary Corps and the Medical Administrative Corps now may be released after thirty-two months instead of thirty-six months of service.

Text of the Navy Department statement follows:

Reference to Alnavs 281-46 and 379-46. Effective November 1, 1946, the service requirement for all United States naval reserve dental officers is reduced from thirty months to twenty-four months. Service requirements are computed from the date of reporting for active duty as dental officers. Paragraphs 9 (a) (1) Alnav 384-46 as promulgated in Alnavs 476-46 and 529-46 shall not apply to naval reserve dental officers. Naval reserve dental officers shall arrange appropriate activities performing separation functions sufficiently in advance so that the separation processing will be completed and the terminal leave granted will expire not later than their date of eligibility for release from active duty.

DONALD M. GALLIE, A.D.A. PAST PRESIDENT, DIES AT 80

Donald M. Gallie, 80, former head of the Department of Operative Dentistry at the University of Illinois and Past President of the American Dental Association, died October 8 in St. Francis Hospital, Evanston, Ill.

Dr. Gallie retired from active teaching in 1934 after twenty-nine years at the University of Illinois. He was president of the Chicago Dental Society in 1911 and President of the American Dental Association in 1914-15.

Surviving are the widow, Harriet, and a son, Donald M. Gallie.

WAR DEPARTMENT OFFERS DENTAL INTERNSHIPS TO SENIOR STUDENTS

A limited number of dental internships and reserve commissions have been offered by the War Department to senior class students in approved dental schools, Maj. Gen. Norman T. Kirk, Surgeon General of the Army, has announced.

Students selected will be commissioned as reserve first lieutenants and will be placed on active duty for one year in an army dental clinic. Pay and allowance will total $3,804 for a married officer and $2,652 for a single man.

Internships will be of the rotating type, including training in oral diagnosis, roentgenology, prosthetics, oral surgery, periodontia and operative dentistry, Major General Kirk said.

The Army is looking for men who will develop into Regular Army Dental Corps officers, the Surgeon General said. Men recommended for the Regular Army at the end of their internship will receive credit for a year of service for pay and promotion purposes and also for the year of experience required for a permanent commission.

Men who fail to meet army requirements or who do not wish permanent commissions will revert to inactive status at the end of a year. Senior students interested in the program should consult the dean of their school for further information.

NAVAL DENTAL BILL LEADS TO DENTAL CORPS REORGANIZATION

The passage of the Naval Dental Bill, which was sponsored by the American Dental Association, has led to the reorganization of the Navy Dental Corps, details of which were announced recently by Vice Admiral Ross T. McIntire, Chief of the Bureau of Medicine and Surgery. Rear Admiral Alexander G. Lyle has been appointed Assistant Chief of Bureau for Dentistry and will be concerned primarily with matters of policy. Rear Admiral Alfred W. Chandler has been named Chief of the Dental Division and will direct the operations of that division. The details of the reorganization as released by the Navy follow:

General.—1. The dental functions of the Bureau of Medicine and Surgery as outlined herein and reflected in the attached chart are approved and shall become effective immediately and all matters relating to dentistry, as hereinafter prescribed, shall be referred to the Dental Division.

2. An office of the Chief of Dental Division is hereby established under the policy control of the Assistant Chief of Bureau for Dentistry. An officer of the Dental Corps of the Navy will be detailed as the Chief of this Division.

3. The Dental Division shall (a) establish professional standards and policies for dental practice; (b) conduct inspections and surveys for maintenance, efficiency and economy of such standards; (c) initiate and recommend action pertaining to complements, appointments, advancements, training, assignment, and transfer of dental personnel; and (d) serve as the advisory agency for the Bureau of Medicine and Surgery on all matters relating directly to dentistry.

4. In order to expedite these functions, there is established under the Assistant Chief of Bureau for Dentistry, an Office of the Chief of Dental Division consisting of (a) a Dental Professional Branch, (b) a Dental Inspection Branch, and (c) a Dental Personnel Branch.

Assistant Chief of Bureau.—5. The Assistant Chief of Bureau for Dentistry shall be responsible for the functions outlined in paragraph 3(e) and 5, reference (a).

Chief of Division.—6. The Chief of Dental Division shall be responsible for the performance of all dental functions outlined in paragraph 3 of this directive, but shall adopt no major policies, methods, or procedures without the approval of the Assistant Chief of Bureau for Dentistry.

Dental Professional Branch.—7. The Dental Professional Branch shall perform the functions listed in items (a) and (d) as relates to professional standards and policies, and shall be responsible for the development, coordination, and evaluation of training programs for dental personnel listed in item (c) of paragraph 3 of this directive. This branch shall consist of (a) the Dental Standards Section and (b) the Dental Training Section.

8. The Dental Standards Section shall perform the functions of the Dental Professional Branch as they relate to professional standards and policies for dental practice.

9. The Dental Training Section shall perform the functions of the Dental Professional Branch as they relate to the development, coordination, and evaluation of training programs for dental personnel.

Dental Inspections Branch.—10. The Dental Inspections Branch shall perform the functions listed in item (b), paragraph 3 of this directive. This branch shall function under the General Inspector for Dentistry, who is directly under the Chief of the Dental Division.

Dental Personnel Branch.—11. The Dental Personnel Branch shall perform the functions listed in item (c) except for the development, coordination and evaluation of training programs, and item (d) as relates to officer and enlisted personnel matters, of paragraph 3 of this directive. This Branch shall consist of (a) a Dental Appointment and Advancement Section, (b) a Dental Assignment and Transfer Section, and (c) an Enlisted Personnel Section.

12. The Dental Appointment and Advancement Section shall perform the functions of the Dental Personnel Branch as they relate to professional qualifications of dental officer personnel.

13. The Dental Assignment and Transfer Section shall perform the functions of the Dental Personnel Branch as they relate to complements, assignments, transfers and releases of dental officer personnel.

14. The Enlisted Personnel Section shall perform the functions of the Dental Personnel Branch as they relate to enlisted personnel.

15. Reference (b) is hereby superseded and cancelled.

OUTLINE AGE REQUIREMENTS FOR DEPARTMENT OF MEDICINE

Medical policy on age requirements for appointment in the Department of Medicine and Surgery was outlined recently by Gen. Omar N. Bradley, Veterans Administrator.

A directive issued by General Bradley at Washington read as follows:

Doctors of medicine and dentistry will not be appointed in the Department of Medicine and Surgery if fifty-fifth birthday has been reached, unless they possess unusual special professional or administrative qualifications for senior or chief grade. Exceptions, age: fee-basis physicians and dentists, consultants and attending physicians and dentists, part-time teachers and part-time specialists.

No dentist past his forty-fifth birthday will be appointed to a full-time position as a clinical dentist. Dentists between forty-fifth and fifty-fifth birthday qualified in a specialty or previously demonstrated administrative ability may be appointed in the capacity of full-time specialist or to dental administrative work in full intermediate and senior grades.

No nurse, if fiftieth birthday has been reached, will be appointed unless she possesses unusual special qualifications and is appointed in assistant director grade.

Permanent civil service employees of the medical and hospital service as constituted prior to January 3, 1946, are exempt from the provisions of this directive (10a).

SURPLUS PROPERTY SALES ABROAD TO AID EXCHANGE OF STUDENTS

President Truman on August 1 signed into law the Fulbright bill, authorizing the Department of State to use some of the proceeds from surplus property sales abroad for exchanges of students and other educational activities.

The bill provides that up to $20,000,000 can be earmarked for educational exchanges with any country which buys surplus property, and up to $1,000,000 can be spent each year in each country where such an agreement is made.

The following types of educational activities are authorized: higher education or research in foreign countries on the part of American students; lecturing in foreign institutions by American professors; study by foreign students at American nondenominational institutions abroad; transportation of foreign students to the United States to attend American universities.

HONOR NEW DEAN AT NEW YORK UNIVERSITY DENTAL COLLEGE

More than a thousand alumni and associates of New York University, College of Dentistry, honored Walter H. Wright, new dean of the college, at a dinner October 3 in New York.

Speakers were J. Hillis Miller, assistant commissioner of the New York State Department of Education; Arthur H. Merritt, Past President of the American Dental Association; and Frank Rohr, president of the alumni association of the College of Dentistry. Harry Woodburn Chase, chancellor of the university, was toastmaster.

SEEK TWO DENTISTS TO WORK FOR YEAR ON LABRADOR COAST

Faced with a growing dental problem on the Labrador Coast, the Grenfell Association on September 7 announced that it is prepared to pay as high as $1,500 and expenses for a year of service on the part of an experienced dentist. Two full-year positions are open.

Further information can be obtained by writing James M. Dunning, International Grenfell Association, 156 Fifth Ave., New York.

Milan A. Logan, who recently resigned as a member of the Council on Dental Therapeutics

LOGAN RESIGNS AS MEMBER OF COUNCIL ON DENTAL THERAPEUTICS

Milan A. Logan, Ph.D., a biochemist of international reputation, has resigned as a member of the Council on Dental Therapeutics of the American Dental Association. Dr. Logan was a charter member of the Council. At the time of his appointment, he was a member of the faculty of the Medical School of Harvard University. He left Harvard in 1940 to become head of the Department of Biochemistry at the University of Cincinnati.

Dr. Logan is an authority on the metabolism of calcium, phosphorus and the vitamins. His decision to resign from the Council was due to the pressure of other duties, which he felt would make it impossible for him to continue to carry the heavy responsibilities entailed by membership on the Council on Dental Therapeutics.

GREATER NEW YORK DENTAL MEETING OPENS DECEMBER 9

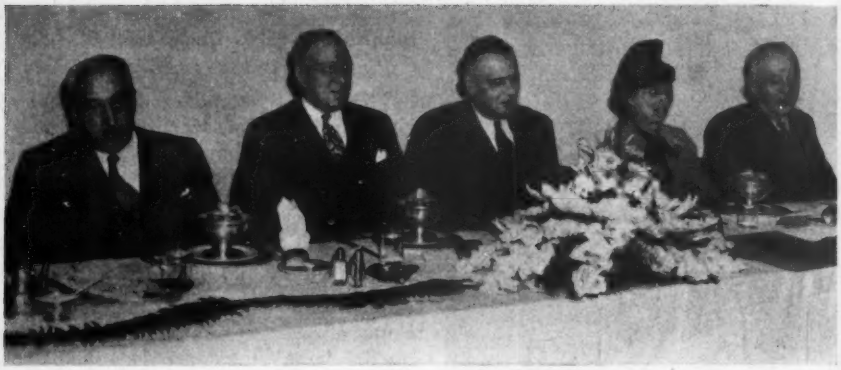
The twenty-second annual Greater New York Dental Meeting, which attracts visitors from all parts of the country each year, will open at the Hotel Pennsylvania, New York, on December 9 and will continue through December 13. This second postwar meeting will present all of the traditional features which were eliminated last year because of wartime restrictions. An unusually large attendance is anticipated because of heavy preliminary requests for accommodations.

In addition to the usual display of table clinics and exhibits of various kinds, the convention will feature twenty morning registered clinics and the same number in the afternoon. There will also be twenty topic discussions by authorities from various fields of dentistry. A new feature this year will be a forum "In Our Opinion" at which controversial subjects will be discussed and at which selected dentists will answer questions submitted.

Willard S. Bell is general chairman of the meeting. Information may be secured from K. Neil Donally, chairman, Press and Publication Committee, Room 106A, Hotel Pennsylvania, New York 1.

MID-CONTINENT DENTAL CONGRESS MEETS IN ST. LOUIS NOVEMBER 4-6

One of the large dental meetings of the Mid-West will open on November 4 in the Jefferson Hotel, St. Louis, when the Mid-Continent Dental Congress resumes operations after a wartime interruption. The meetings, for which an elaborate scientific and social program is planned, will continue through November 6. E. C. Brooks is chairman of the meeting, which annually attracts many dentists from Missouri, Kansas, Oklahoma and other Midwestern states.



Central Office Honors Dr. Pinney

Speakers at the testimonial luncheon given by the Central Office staff October 1 in honor of Dr. Harry B. Pinney, retiring General Secretary, were, from left to right, Harold W. Oppice, member of the Board of Trustees; Dr. Pinney; Lon W. Morrey, toastmaster; Mrs. Pinney; and Roscoe H. Volland, Treasurer

ALPHA OMEGA FRATERNITY TO HOLD CONVENTION IN DETROIT

The Alpha Omega Dental Fraternity will hold its thirty-ninth annual convention December 28-31 and January 1 at the Book Cadillac Hotel in Detroit.

Members should write Louis I. Galin, National Marshal, at 17599 Greenlawn Ave., Detroit 1, for reservations.

WAA ADMINISTRATOR EXPLAINS DISPOSAL SYSTEM FOR SURPLUSES

Surplus dental equipment available through the War Assets Administration is now being allocated by the WAA office in Washington to various regions on the basis of the number of returned dental veterans, Gen. Robert M. Littlejohn, WAA administrator, has announced.

Inventories of dental equipment are reported daily to Washington as soon as the items are inspected and confirmed for sale. The sales are then handled through notices to veteran certificate holders, with the orders filled first for the oldest certificate.

General Littlejohn reported that dental equipment on the set-aside list is in great demand. Allocation on the basis of returned veterans and sales through certificates has been developed as the only practical means of obtaining equitable distribution, he said.

A.D.A. OFFICE STAFF HONORS DR. HARRY PINNEY AT LUNCHEON

The Central Office staff of the American Dental Association gave a luncheon October 1 in honor of Dr. Harry B. Pinney, General Secretary of the Association, who is retiring after nineteen years in office.

Approximately sixty staff members attended the luncheon. Lon W. Morrey, director of public relations, was toastmaster for the event. Speakers were Roscoe H. Volland, Treasurer; Donald A. Wallace, secretary of the Council on Dental Therapeutics; Harold W. Oppice, member of the Board of Trustees; and Mrs. Josephine P. Hunt, librarian.

A gift of luggage was presented to Dr. Pinney as a farewell memento from the staff.

All the speakers expressed regret at Dr. Pinney's retirement and apprecia-

tion of his nineteen years of contribution to dentistry as a whole and to the American Dental Association.

PUBLIC HEALTH ASSOCIATION MEETS IN CLEVELAND NOVEMBER 11

At the annual meeting of the American Public Health Association, which will be held in Cleveland on November 11-16, the Dental Section will have a four-day session devoted to a discussion of dental problems in public health.

The program on November 11 will be a joint one with the American School Health Association. Donald Goudey will speak on "Improving Dental Health Through Intensive Education." On November 12, the speakers will be Allen O. Gruebbel, Ernest A. Branch, Fred Wertheimer, John W. Knutson and C. B. Bray. A symposium on standards of dental care in public health programs for children will follow in the afternoon. Speakers participating will be Lester A. Gerlach, Norman F. Gerrie and Peter J. Warren.

On November 13 there will be a joint session of the Dental Section and the American School Health Association. Speakers will be B. Holly Broadbent, Olin E. Hoffman, F. J. McClure, Carl L. Sebelius and Walter Wilkins. On the morning of November 14 the speaker will be Philip E. Blackerby, Jr. A joint session of the Dental, Food and Nutrition Sections in the afternoon will close the program. Speakers will be Gerald J. Cox, Paul E. Boyle and Philip C. Jeans.

HONOR SIR FRANK COLYER, BRITISH DENTIST, ON EIGHTIETH BIRTHDAY

Sir Frank Colyer, distinguished British dentist, will be honored on the occasion of his eightieth birthday late this year by the presentation of his portrait to the British Dental Association. Sir Frank, who is well known for his contributions to international dentistry, is the author of many books including: *Dental Surgery and Pathology, Dental Disease in Its Relation to General Medicine, John Hunter and Odontology* and *Chronic General Periodontitis.*

Friends of this country are invited to contribute to the portrait fund. Oversubscriptions will be given to the dental museum to which Sir Frank has contributed for the last forty-six years. Contributions should be sent to Lilian Lindsay, The Honorable Library, British Dental Association, 13 Hill St., Berkeley Square, London, W.1.

CUBAN DENTAL SOCIETY TO HOLD NATIONAL CONGRESS IN NOVEMBER

The second National Congress of the Cuban Dental Society will be held November 6-10 in Havana under the auspices of the *Colegio Estomatologico Nacional.*

An invitation to members of the American Dental Association to attend the meeting has been extended by Rafael Casado Quiros, president of the *Colegio Estomatologico Nacional.*

TREASURY DEPARTMENT URGES PURCHASE OF EXTRA BONDS

The U. S. Treasury Department is urging the purchase of an extra U. S. savings bond during the Minute Man campaign from November 11 to December 7.

During the next year Americans will earn more than $20,000,000,000 which cannot be spent for manufactured goods and which should be tucked away for future security as a safeguard against spiralling prices, the Treasury Department said.

PAN AMERICAN ODONTOLOGISTS TO MEET AT DINNER DECEMBER 11

The tenth annual dinner meeting of the Pan American Odontological Association will be held December 11 at the Hotel Pennsylvania in New York.

Promote Children's Dentistry

Scene at the annual dinner of the New Jersey Society for the Promotion of Children's Dentistry, held September 7 at the Hotel Monterey, Asbury Park, N. J. Pictured are (left to right): J. M. Wisan, president of the American Society of Dentistry for Children; Harold K. Addelston, assistant professor and chairman of the Department of Dentistry for Children, College of Dentistry, New York University; and John C. Campi, president of the New Jersey society

POLK AKERS, PIONEER IN ONE-PIECE CASTING, DIES

Polk E. Akers, Chicago dentist and inventor of the Akers technic of one-piece casting, died at his home September 8 at the age of 65 after a long illness.

A graduate of the Chicago College of Dental Surgery and a life member of the Chicago Dental Society, Dr. Akers also was identified with several other dental associations during his professional career.

Surviving are a daughter, Lucille; a brother, Frank, of Harrisburg, Pa., and a sister, Margaret, of Hollidaysburg, Pa.

NEW JERSEY PEDODONTOLOGISTS HOLD MEETING AT ASBURY PARK

The New Jersey Society for the Promotion of Children's Dentistry held its annual meeting September 7 at the Hotel Monterey, Asbury Park, N. J.

Harold K. Addelston, assistant professor and chairman of the Department of Dentistry for Children at the College of Dentistry, New York University, presented a table clinic on "Cast Gold Inlay for Deciduous Teeth."

Approximately fifty persons attended the annual dinner meeting, presided over by John C. Campi, president of the society. The principal address was delivered by Dr. Addelston on "The Education of the Dentist, the Child and the Parent on the Importance of Children's Dentistry."

PUBLISH PROSPECTS FOR JOBS IN DENTAL HYGIENE

Employment prospects in dental hygiene are surveyed in a revised *Occupational Abstract* just published by Occupational Index, Inc., New York University, New York 3.

Summarized in the six-page leaflet is available information on the nature of the work, abilities and training required, earnings, number and distribution of workers, advantages, disadvantages and prospects for future employment. Sources of further information and references for supplementary reading are appended.

SET OCTOBER 28-NOVEMBER 30 FOR UNESCO MONTH OBSERVATION

To mark the opening of the general conference of the United Nations Educational, Scientific and Cultural Conference in Paris early in November, the period October 28-November 30 has been designated as "UNESCO Month," according to an announcement from the Department of State.

Aims of "UNESCO Month," the announcement said, will be (1) to emphasize that mutual understanding among peoples contributes to peace and security and (2) to show how UNESCO can help promote mutual understanding among peoples.

The state department urged national and local organizations, libraries, schools, colleges, churches and publications to observe the period with UNESCO programs, exhibits, study groups, lectures and similar observations, and, in case of publications, by carrying reports, discussions and addresses from the Paris conference and featuring programs and articles on international cooperation.

FORM HOSPITAL COUNCIL TO CARRY OUT HILL-BURTON ACT

Watson B. Miller, Federal Security Administrator, announced on September 12 formation of a Federal Hospital Council and an advisory committee to assist Surgeon General Thomas Parran of the U. S. Public Health Service.

The council and committee, Mr. Miller said, would formulate plans for administration of the recently-enacted Hill-Burton Act, which authorizes a federal appropriation of $375,000,000 during the next five years for construction of hospitals and health centers.

In accordance with provisions of the act, the council is composed of the Surgeon General, who serves as chairman, ex officio, and eight members appointed by the Federal Security Administrator. Four members are outstanding in health and hospital fields, and four representatives of the consumers of hospital services.

Mr. Miller pointed out that the Federal Hospital Council is unique in that the Hill-Burton Act vests it with certain administrative functions, including approval of general regulations under which the program will operate.

Representing dentistry on the advisory committee is Carl W. Waldron, School of Dentistry, University of Minnesota.

ST. LOUIS DENTAL ALUMNI TO STAGE POSTWAR REUNION

The St. Louis University Dental Alumni Association will hold a postwar reunion at the school building, 3556 Caroline St., St. Louis, November 22 and 23.

Hotel reservations can be obtained by writing O. J. Dick, 1657 South Grand Blvd., St. Louis.

LIVINGSTONE NAMED DIRECTOR OF MONTANA DENTAL DIVISION

Francis I. Livingstone, D.D.S., M.S.-P.H., assumed the post of Director of the Dental Division, Montana State Board of Health, on October 1. Dr. Livingstone resigned as head of the Dental Hygiene Section, Washington State Department of Health, in September.

NAVY MEDICINE BUREAU ROUNDS OUT 104th YEAR

The Bureau of Medicine and Surgery, guiding agency for the Navy and Marine Corps in matters of health and disease through four major wars, was 104 years old August 31.

The bureau, which includes the Dental Corps, achieved a record of survival of 97.8 per cent of Navy and Marine battle casualties in World War II, an announcement said.

RESEARCH COMMISSION

LIST OF CERTIFIED DENTAL MATERIALS

REVISED TO AUGUST 30, 1946

BECAUSE there has been some confusion regarding Certified Dental Materials, the Research Commission presents this summary to clarify the operation of its certification plan.

The first fundamental item in this plan is the existence of official American Dental Association Specifications for Dental Materials. These specifications are the outcome of research by the A.D.A. Research Fellowship at the National Bureau of Standards, correlated with the clinical experience of members of the Association.

As the second step in the operation of the plan, the manufacturers are invited to certify to the Research Commission that their products comply with the specifications. It would be manifestly impossible for the Commission (through the A.D.A. Research Fellowship at the National Bureau of Standards) to test every lot of every certified material. For this reason, the Commission has required that the manufacturer, on certifying a product, not only must guarantee that this product meets specification requirements but must also furnish evidence that he maintains a testing program adequate to insure continual compliance of the product.

On receipt of a certification for a new product with all required data, the Commission procures a random sample through regular trade channels, usually by asking a dentist to act as its agent. This sample is tested for compliance with all specification requirements. Only when the certification is complete and in proper form and the sample has passed all specification tests does the Commission accept the manufacturer's certification. The name of the product is then added to the List of Certified Dental Materials.

This, however, is not the complete story. The continuation of any product on the List of Certified Dental Materials is contingent on its maintenance at specification quality. Surveys of all products on the list are made by the A.D.A. Research Fellowship at the Commission's direction. These surveys are made on samples procured on the open market. Whenever a material fails to comply with the specification requirements, it is removed from the list and the manufacturer is notified that his certification of the product is no longer acceptable. Thus, although the Commission cannot test the entire production of dental materials, its Certification Plan calls for continuous testing by the manufacturer and check tests by the Fellowship so that a constantly high level of quality of the products on the list will be maintained.

In the purchase of certified material for use in dental practice, these lists should be used as a buyer's guide. In addition, the package of material re-

ceived should be checked for its exact name as given in the lists, and for a statement thereon guaranteeing compliance with the specification.

Certified Amalgam Alloys (A.D.A. Specification No. 1)

Alloy	Mfr. or Distributor
Accurate Metalloy (filings)	The L. D. Caulk Co.
Ackerman (filings)	Ackerman Dental Mfg. Co.
Argentum "A" cut; fine cut; medium cut; shavings	Hammond Dental Mfg. Co.
Aristaloy	Baker and Co., Inc.
Banner (filings)	Goldsmith Bros. Smelting & Refining Co.
Blue Diamond (filings)	Reliance Dental Mfg. Co.
Certified	Lee S. Smith and Son Mfg. Co.
Cresilver	Crescent Dental Mfg. Co.
Dee (filings)	Thomas J. Dee & Co.
Diamond Edge	Young-Baker & Co.
Excel	Daniels Dental Alloy Co.
Fellowship; New Fellowship	Dental Protective Supply Co.
Fleck's	Mizzy, Inc.
Garfield's	Garfield Smelting and Refining Co.
Gold Bond	Jefferson Laboratories
Lustraloy Regular; Cut T	Pfingst & Co.
Minimax (filings) 173; 177; 178; 183; White Gold & Platinum; (shavings) 177; 178	The Minimax Co.
Mission No. 5; No. 5 "A" Cut; No. 6	Henry F. Bruce Co.
Modeloy (quick setting filings)	Crescent Dental Mfg. Co.
Mynol Improved	Mynol Chemical Co.
New Deal	Miller Dental Co.
Odontographic "Improved" (filings)	Odontographic Mfg. Co.
Pearlol	Wildberg Bros. Smelting & Refining Co.
Research Oralloy	Precious Metals Research Works, Inc.
Royal Special First Setting; Super First Setting	Garhart Dental Specialty Co.
Silver Crown Fast; Medium; Slow	General Refineries, Inc.
Silverloy (filings); (shavings)	Crescent Dental Mfg. Co.
Speyer	Speyer Smelting and Refining Co.
S-C Medium (filings)	Stratford-Cookson Co.
S-R	Lee S. Smith & Son Mfg. Co.
Standard	Standard Dental Products Co.
True Dentalloy (filings); (cut "A")	The S. S. White Dental Mfg. Co.
Twentieth Century Regular; Special	The L. D. Caulk Co.
Uniform	Henry Nelms & Son
Vertex	Vertex Dental Products Co.
White Beauty	Lang Dental Mfg. Co.

Certified Inlay Casting Investments (A.D.A. Specification No. 2)

Investment	Mfr. or Distributor
Kerr Cristobalite-Inlay	Kerr Dental Mfg. Co.
Ransom and Randolph Gray	The Ransom & Randolph Co.
Security Improved Inlay	The Cleveland Dental Mfg. Co.
Steele's-Super	The Ransom & Randolph Co.

Certified Impression Compounds (A.D.A. Specification No. 3)

Compound	Type	Mfr. or Distributor
Certified	I	Lee S. Smith & Son Mfg. Co.
Dresch	I	The Ransom & Randolph Co.

Kerr Perfection; No. 2 Soft Green	I	Kerr Dental Mfg. Co.
Mizzy—Low Heat	I	Mizzy, Inc.
S. S. White—Black—Tray	II	The S. S. White Dental Mfg. Co.

Certified Inlay Casting Waxes (A.D.A. Specification No. 4)

Wax	Mfr. or Distributor
Caulk-Blue	The L. D. Caulk Company
Kerr-Blue—Hard	Kerr Dental Mfg. Co.
Security	The Cleveland Dental Mfg. Co.
Sterling	Baker & Co., Inc.

Certified Inlay Casting Gold Alloys (A.D.A. Specification No. 5)

Type A, Soft

Alloy	Mfr. or Distributor
Aderer-A-Soft	Julius Aderer, Inc.
Baker Inlay Soft	Baker & Co., Inc.
Bruce "A"; No. 1	Henry F. Bruce Co.
Chilcast No. 1	Vernon-Benshoff Co.
Crown Inlay No. 2 Soft; K	General Refineries, Inc.
Deeone	Thomas J. Dee & Co.
GB Inlay No. 1 Soft	Goldsmith Bros. Smelting & Refining Co.
Jelenko Special Inlay	J. F. Jelenko & Co., Inc.
Krause Soft Inlay	Krause Gold Refinery
Research-A-Soft	Precious Metals Research Works, Inc.
Spyco Soft	Spyco Smelting & Refining Co.
S. S. White No. 2; No. 900; No. 940	The S. S. White Dental Mfg. Co.
Stern S	I. Stern & Co., Inc.
Williams No. 3; Will-Cast 22	The Williams Gold Refining Co., Inc.

Type B, Medium

Alloy	Mfr. or Distributor
Aderer-B-Medium	Julius Aderer, Inc.
Baker Inlay Medium	Baker and Co., Inc.
Bruce "O"; No. 2	Henry F. Bruce Co.
Chilcast M; 1M; 2M	Vernon-Benshoff Co.
Crown Inlay No. 1 Hard; Knapp No. 2; T	General Refineries, Inc.
Deetwo	Thomas J. Dee & Co.
GB Inlay No. 2 Medium Hard	Goldsmith Bros. Smelting & Refining Co.
Jelenko Modulay; Platincast	J. F. Jelenko & Co., Inc.
Krause Hard Inlay	Krause Gold Refinery
Nelms E	Henry Nelms & Son
Ney-Oro A-1; A-10	The J. M. Ney Co.
Spyco Medium	Spyco Smelting & Refining Co.
S. S. White No. 1; No. 5; No. 820	The S. S. White Dental Mfg. Co.
Stern 1; No. 3290	I. Stern & Co., Inc.
Tinker No. 1; Inlay	Spyco Smelting & Refining Co.
Wildberg "A"	Wildberg Bros. Smelting & Refining Co.
Williams Pioneer; Special Inlay	The Williams Gold Refining Co., Inc.

Type C, Hard

Alloy	Mfr. or Distributor
Aderer-C-Hard; "Dressel"	Julius Aderer, Inc.
Baker Hard Inlay	Baker & Co., Inc.
Bruce No. 3; No. 5	Henry F. Bruce Co.
Chilcast No. 2; No. 2-H	Vernon-Benshoff Co.

Crown No. 9; Knapp No. 3; Supreme Inlay; TT	General Refineries, Inc.
Deesix	Thomas J. Dee & Co.
GB Inlay No. 3 Hard	Goldsmith Bros. Smelting & Refining Co.
Jelenko Durocast; Firmilay	J. F. Jelenko & Co., Inc.
Krause KK	Krause Gold Refinery
Research Hard Cast No. 5; Inlay	Precious Metals Research Works, Inc.
Spyco No. 6	Spyco Smelting & Refining Co.
S. S. White No. 8; No. 13; No. 860 Hard	The S. S. White Dental Mfg. Co.
Stern 2; 3337; 3465; 6485	I. Stern & Co., Inc.
Tinker No. 1H; No. 2	Sypco Smelting & Refining Co.
Wildberg "C"	Wildberg Bros. S. & R. Co.
Williams Klondiker; No. 1; Special "Four"	The Williams Gold Refining Co.

Certified Dental Mercuries (A.D.A. Specification No. 6)

Mercury	Mfr. or Distributor
Argentum	Hammond Dental Mfg. Co.
Ballard's	Quicksilver Producers Association
Chemically Pure	The S. S. White Dental Mfg. Co.
Crown	General Refineries, Inc.
Dee	Thomas J. Dee & Co.
Dental	Goldsmith Bros. Smelting & Refining Co.
Dental, C. P.	F. W. Berk & Co., Inc.
Fellowship	Dental Protective Supply Co.
Garfield's	Garfield Smelting and Refining Co.
Garhart's Positively Pure	Garhart Dental Specialty Co.
Krause's Pure	Krause Gold Refineries
Minimax	The Minimax Co.
Mission	Henry F. Bruce Co.
Mynol	Mynol Chemical Co.
Ney's C. P.	The J. M. Ney Co.
Odontographic	Odontographic Mfg. Co.
Research	Precious Metals Research Works, Inc.
Spectropure	Baker & Co., Inc.
Twentieth Century	The L. D. Caulk Co.
Williams	The Williams Gold Refining Co., Inc. (Applies to Williams' one pound bottles only, as quarter pound containers are not glass.)

Certified Wrought Gold Wire Alloys (A.D.A. Specification No. 7)

Alloy	Mfr. or Distributor
Aderer No. 1; No. 3; No. 4; No. 20 Clasp	Julius Aderer, Inc.
Baker 21; Q. A.	Baker & Co., Inc.
Crown Hylastic	General Refineries, Inc.
Deepep-Hard	Thomas J. Dee & Co.
GB Extra High Fusing; Medium Fusing; Regular High Fusing	Goldsmith Bros. Smelting & Refining Co.
Jelenko No. 3 Wire; Super Wire	J. F. Jelenko & Co., Inc.
Ney-Oro Elastic No. 4; Neydium 9	The J. M. Ney Co.
Spyco No. 2; No. 4	Spyco Smelting & Refining Co.
S. S. White No. 12; No. 61 Metalba	The S. S. White Dental Mfg. Co.
Stern No. 2657	I. Stern and Co., Inc.
Williams No. 1 Super; No. 2 High Fusing Clasp; No. 3 High Tensile	The Williams Gold Refining Co., Inc.
Vernon-Benshoff Clasp Wire No. 6	Vernon-Benshoff Co.

Certified Zinc Phosphate Cements (A.D.A. Specification No. 8, First Revision)

Cement	Mfr. or Distributor
Ames Z-M	The W. V-B Ames Co.
Bosworth's Zinc	Harry J. Bosworth Co.
Caulk Crown and Bridge; Petroid Improved; Tenacin	The L. D. Caulk Co.
Certicem	Lee S. Smith & Son Mfg. Co.
Fleck's Extraordinary	Mizzy, Inc.
Lang Dental Crown, Bridge and Inlay	Lang Dental Mfg. Co.
S-C	Stratford-Cookson Co.
Smith's	Lee S. Smith & Son Mfg. Co.
S. S. White Silver Improved; Zinc; Zinc Improved	The S. S. White Dental Mfg. Co.

Certified Silicate Cements (A.D.A. Specification No. 9)

Cement	Mfr. or Distributor
Ames Plastic Porcelain	The W. V-B Ames Co.
Astralit	Premier Dental Products Co.
Baker Plastic Porcelain	Baker & Co., Inc.
DeTrey's Synthetic Porcelain	The L. D. Caulk Co.
Durodent Enamel	Oskar Schaefer
Smith's Certified Enamel Improved	Lee S. Smith & Son Mfg. Co.
S. S. White Filling Porcelain Improved	The S. S. White Dental Mfg. Co.

Certified Hydrocolloidal Impression Materials (A.D.A. Specification No. 11)

Material	Mfr. or Distributor
Deelastic	Thomas J. Dee & Co.
Dentocoll	The L. D. Caulk Co.
Kerr Hydro-Colloid	Kerr Dental Mfg. Co.
Perfectocoll	Baker & Co., Inc.
Plasticoll	Lee S. Smith & Son Mfg. Co.
Surgident	Surgident, Ltd.

Certified Denture Resins (A.D.A. Specification No. 12)

Material	Form	Mfr. or Distributor
Acralite	Clear, pink; powder-liquid	Acralite Co., Inc.
Ac-Ril	Pink; powder-liquid	Ac-Ril Dental Corporation.
Acri-Lux	Pink; powder-liquid	Acri-Lux Dental Mfg. Co.
B-B	Clear, pink; powder-liquid	Bell Dental Products Co.
Certified	Pink; powder-liquid	Lee S. Smith & Son Mfg. Co.
Coralite	Pink; powder-liquid	Coralite Dental Products Co.
Crystolex Form 102	Pink; powder-liquid	Kerr Dental Mfg. Co.
Densene	Clear, pink; powder-liquid	Cosmos Dental Products, Inc.
Justi-Tone	Pink; powder-liquid	H. D. Justi & Son, Inc.
Lang's	Pink; powder-liquid	Lang Dental Mfg. Co.
Lucitone	Clear, pink; plastic cake Clear, pink; powder-liquid	The L. D. Caulk Co.
Luxene 44	Pink; plastic cake	Luxene, Inc.
Marvel	Pink; powder-liquid	Marvel Dental Products Co.
Opalex "45"	Pink; powder-liquid	The Opalex Co.
Vernonite	Clear, pink; plastic cake Pink; powder-liquid	Vernon-Benshoff Co.
Vitacrilic D, L	Pink; powder-liquid	Fricke Dental Mfg. Co.
Vita-Lite	Clear, pink; powder-liquid	Vita-Lite Products Co.
Vitalon	Clear, pink; powder-liquid	Austenal Laboratories, Inc.

COUNCIL ON DENTAL HEALTH

LOUISIANA DENTAL HEALTH COUNCIL CONDUCTS INSTITUTE ON DENTAL HEALTH EDUCATION

On May 24, 1946, an institute on dental health education was held in New Orleans under the sponsorship of the Council on Dental Health of the Louisiana State Dental Society. The conference was attended by approximately fifty persons representing health, education and welfare agencies, and the dental profession.

The institute was organized for the purpose of examining critically the basic dental health problems with the view of finding the means to attain four objectives:

1. To give every community an understanding of its dental health problems.
2. To organize good school-community dental health educational programs.
3. To make available more dental services for children.
4. To influence more high school students to enter the dental profession.

In his opening remarks to the Institute, the presiding officer, Leo J. Schoeny, chairman of the Louisiana State Council on Dental Health, stated:

> Seventeen years ago I presided at the meeting of the Louisiana State Dental Society when the State Bureau of Dental Health and Education was created. The State Dental Society recognized the need of providing more adequate dental care for the people of the state at that time, particularly the child population, as well as the need for creating a more widespread understanding and appreciation of dental health. . . . In 1942 we succeeded in having the State Department of Health set up a dental division with a full-time dentist in charge. . . . Although we made considerable progress in developing both public and professional interest in the problem and in providing more adequate care for the children of our state, we realized the assistance of other interested groups was necessary if the whole problem was to be met. We felt we needed the benefit of the thinking and planning of educators, health workers and other interested people. . . . This dental health educational institute today is the result, and we believe it marks the beginning of a new era for dental health in Louisiana. Where we go from here and what we contribute to the future of our people, the students and the children yet to be born, depends on each one of you.

Factual information was presented by two additional speakers. Philip Jay, of the University of Michigan, discussed "Dental Health Education—Limitations of Control Measures," and J. Melville Smith III, Louisiana chairman of procurement and assignment, presented an outline of "Limitation of Dental Personnel."

Dr. Jay pointed out that:

> Health education problems are real. The public has been exposed to a great deal of misinformation relative to maintenance of the health of the teeth and of the tissues which support the teeth. . . . Perhaps we do not understand the entire problem but we *do* have some very definite facts upon which to base valid dental health information. . . . The disease which is of immediate concern to young age groups is ordinary tooth decay. This disease always begins on the oral surface of the crown of the tooth. It is known that an acid may be produced on the surface of the tooth under bacterial plaques. Continuous production of acids in these areas results in the enamel of the affected teeth going into solu-

tion. We know that susceptibility to cavities is indicated by the count of certain bacteria and the type of bacteria is recognized. Their growth is not affected by fortification of the diet. These organisms are extremely susceptible to the presence of sugar in the diet. . . . Prevention of cavities may be gained by the restriction of sugar. In areas where the water contains fluorine there is a reduction in the incidence of cavities. Fluorine may prove to be a caries inhibiting agent. . . . Nutrition is important after birth until the eighth year of life as far as tooth structure is concerned, but dental cavities cannot be prevented by fortifying the diet. . . . There are no statistics which indicate that cavities are more prevalent during pregnancy. Since there is no connective tissue in the enamel, the salts of calcium or phosphorus cannot be withdrawn.

In discussing the dental personnel problem, Dr. Smith stated:

The proper operation of a state-wide dental health program requires not only dentists, but also an organization of working personnel, nurses, dental assistants and dental hygienists. . . . The urban population (in Louisiana) is located in fifty-four towns or cities and totals 980,439 people or 41.5 per cent of the population. The rural population totals 1,383,441 or 58.5 per cent of the population. A check of dental personnel reveals that two-thirds of the dentists (in 1941) were located in urban communities and one-third in rural areas. . . . For the betterment of the dental health of the people there should be a more equitable distribution of dentists. The old law of supply and demand, however, has been the determining factor in the selection of the locations of practice by dentists. . . . Every effort should be made to develop in our young people an interest in dentistry as a profession if we wish to overcome practically all of the problems that confront us today.

At the conclusion of the introductory statements by the three speakers, the assembly was divided into three groups. Group I, under the chairmanship of J. W. Brouillette, Ph.D., director of the Extension Division, Louisiana State University, was assigned the task of recommending methods "to help give every community an understanding of its dental health problems." In reporting the results of its deliberations, Group I suggested a number of technics for conducting health education projects and devices for creating an interest in dental health.

The adoption of a "means test" for recipients of dental services at public expense also came up for discussion. Group I reported "that it was not the function of an outside group to propose criteria upon which to base dental indigency. . . . Criteria for dental indigency should be developed on a local basis by people best able to determine the family status of a particular community."

Group II, under the chairmanship of Simon A. McNeely, supervisor of health, physical and safety education, Louisiana State Department of Education, was assigned the responsibility of recommending methods for organizing a good school-community dental health education program. Group II agreed upon a number of objectives of educational programs. It was suggested that the attainment of the objectives could be secured through the coordinated efforts of a community council, a school health committee and classroom teachers. The discussion also brought out the possibility that intensive health education might create a demand for dental service that could not be met. The report contained a word of caution: "Do not oversell a community on dental care which is not available. Stress prevention. Urge conservation and efficient use of dentists' services."

Thomas D. Speidel, dean of the School of Dentistry, Loyola University, was appointed chairman of Group III. The duty of this group was to consider ways and means to "help increase the availability of dental services for children," admittedly a difficult assignment. Group III expressed the view that children are not receiving the dental service they need owing to: (1) an insufficient realization of the importance of dental care; (2) fear of dental treatment; (3) lack of finances; (4) procrastination; (5)

poor transportation; (6) too few dentists in some areas of the state; (7) uneven distribution of dental service, both in respect to location of dentists and to the amount of time which many dentists are willing to devote to care of children's teeth; (8) lack of personnel specializing in dentistry for children; and (9) lack of high efficiency in dental office operations, which thereby decreases the amount of time available for children's dental care.

The proceedings of the institute were summarized by Thomas L. Hagan, dental consultant, Fourth District, U. S. Public Health Service. In evaluating the results of the meeting, he expressed the opinion that "perhaps the most important things emphasized in this conference were (1) the realization that dental health education should be based on scientific fact and (2) that the community is the place where specific planning should be done."

In far too many instances, conferences of this nature result in the adoption of academic principles, which are lost in the minutes of "just another meeting." In this case, fortunately, the meeting was used as a first step toward a constructive program of action. The next step was the appointment of a committee of five to review the findings of the institute and to organize a movement for putting the recommendations into effect. The committee recommended that the Louisiana State Council on Dental Health:

1. Appoint a committee to study and evaluate the authenticity of educational materials.

2. Assist the State Department of Health to organize and initiate model dental health, educational and corrective programs.

3. Use existing facilities in the state to conduct a state-wide economic-sociologic survey as related to dental needs of Louisiana's children.

4. Present Louisiana's dental health problems to at least one important professional educators' meeting within the next year.

The leaders of the dental profession in Louisiana and the civic-minded persons representing other agencies who attended the conference deserve considerable credit for devoting time and energy to a constructive endeavor in the interest of the public.—*Allen O. Gruebbel, D.D.S., Executive Secretary.*

COMMITTEE ON DENTAL MUSEUM

ARMY INSTITUTE OF PATHOLOGY

AND AMERICAN REGISTRY OF PATHOLOGY

WHAT is now known as the Army Institute of Pathology was established in 1863 as the Army Medical Museum. During World War II the activities of the Institute were greatly expanded, especially in the field of diagnostic pathology and research. There are now on file over 170,000 accessions. The results of research at the Institute during the past few years will be published in a volume of about fourteen hundred pages as a part of the official history of World War II. The present director of the Institute is Col. Raymond O. Dart.

On request of Maj. Gen. Norman T. Kirk, the Surgeon General of the Army, the Committee on Pathology of the National Research Council, Division of

Medical Sciences, late in 1945 prepared a report on the future development of the Institute. The report has been approved by the Surgeon General and by the War Department.

The essential recommendations in this report are (1) that a new building of adequate size be constructed; (2) that the Institute be organized in four divisions—Department of Pathology, Army Medical Illustration Service, Army Medical Museum and American Registry of Pathology—each headed by a competent specialist; (3) that the staff of the Institute be drawn both from the commissioned ranks of the Army and from the civilian professions; (4) that a comprehensive educational and training program be undertaken; (5) that the vast store of material at the Institute be used for research; and (6) that the services in pathology in the veterans' hospitals be centralized at the Institute.

The American Registry of Pathology, founded in 1922, thus is, and will continue to be, an integral part of the Army Institute of Pathology. There were, on January 1, 1946, over 43,000 cases registered. To effectuate the new plans as they relate to the Registry, the National Research Council, Division of Medical Sciences, appointed a Committee on the American Registry of Pathology. The members of the Committee are Howard T. Karsner, chairman, Cleveland; Col. James E. Ash, Washington; Brig. Gen. George R. Callender, Washington; Col. Balduin Lucké, Philadelphia; Robert A. Moore, St. Louis; Benjamin Rones, Washington; A. R. Shands, Jr., Wilmington; and Henry A. Swanson, Washington.

At the present time there are fourteen registries as a part of the American Registry of Pathology. These include the Registry of Ophthalmic Pathology, established in 1922, and the Registry of Otolaryngological Pathology, established in 1935, sponsored by the American Academy of Ophthalmology and Otolaryngology; the Lymphatic Tumor Registry, established in 1925, sponsored by the American Association of Pathologists and Bacteriologists; the Bladder Tumor Registry, established in 1927, the Kidney Tumor Registry, established in 1940, and the Prostatic Tumor Registry, established in 1943, sponsored by the American Urological Association; the Registry of Dental and Oral Pathology, established in 1933, sponsored by the American Dental Association; the General Tumor Registry, established in 1937, sponsored by the American Society of Clinical Pathologists; the Registry of Dermal Pathology, established in 1938, sponsored by the American Academy of Dermatology and Syphilology; the Chest Tumor Registry, established in 1942, sponsored by the American Society of Thoracic Surgeons; the Registry of Neuropathology, established in 1943, sponsored by the American Association of Neuropathologists; the Registry of Orthopaedic Pathology, established in 1943, sponsored by the American Academy of Orthopaedic Surgeons; the Registry of Veterinary Pathology, established in 1944, sponsored by the American Veterinary Medical Association; and the Registry of Gerontology, established in 1945, sponsored by the Gerontological Society, Inc.

Plans for additional registries are under consideration. A professional scientific society wishing to sponsor a registry should communicate with the Director, Army Institute of Pathology, Seventh St. and Independence Ave., S.W., Washington 25. The society appoints a committee to work with the Director in supervision of the activities of the Registry, and makes an annual contribution to the budget of the Registry which is administered by the National Academy of Sciences.

All specimens in the Registry are available for review and research by competent investigators. Sets of slides and

accompanying syllabuses on special fields are available for loan to the civilian professions and officers in the federal services. Physicians, dentists and veterinarians are urged to send to the Registry unusual specimens together with an abstract of the history. The contributor receives a report on each specimen and is asked to keep the Registry informed of the follow-up on the patient.

With the reorganization of the Army Institute of Pathology to be completed during 1946 and 1947, Col. James E. Ash has been appointed the full-time scientific director of the American Registry of Pathology, and sufficient clerks and technicians will be available to assure adequate use of the registries for diagnosis, research, training of young men and education of the professions.

COUNCIL ON DENTAL THERAPEUTICS

REPORT ON THE STATUS OF FLENE DENTAL TOPICAL SOLUTION

FLENE Dental Topical Solution is stated to contain sodium fluoride, 2.0 gm.; cetylpyridinium chloride, 0.1 gm.; caesar brown dye, 0.05 gm.; and water to make 100 cc.

The usefulness of this product in the routine practice of dentistry has not yet been established. Its composition appears to be unduly complex.

The Council on Dental Therapeutics has authorized publication of this report.

PROSTHETIC DENTAL SERVICE COMMITTEE

COMMITTEE PRESENTS SECOND IN SERIES OF ARTICLES ON DENTAL LABORATORY PROBLEMS

THIS is the second in a series of educational articles being sponsored by the Prosthetic Dental Service Committee. The Committee urges a careful study of this article by all dentists who use the commercial dental laboratory.

The author of this article is Samuel G. Supplee. Mr. Supplee is a highly respected member of the dental laboratory industry, respected not only in the industry, but by the dental profession as well. He started many years ago to do what he could to improve the quality of prosthetic service by teaching classes for both technicians and dentists. He taught one of the first postgraduate "impression" courses as early as 1913 in the New York College of Dental and Oral Surgery. Now in virtual retirement, he is devoting his energies to the improvement of dentist-laboratory relations and to the education of dentists and technicians as to their respective responsibilities. For this purpose he has prepared a clinic

which illustrates the causes for trouble and places the responsibility.

The clinic is available to joint meetings of dentists and technicians. It consists of three parts: (1) a clear-cut statement of the underlying principles and the most important facts of the dentist-laboratory relationship; (2) a motion picture which illustrates the fundamentals involved; and (3) a table clinic in which common errors of omission and commission by the dentist and the technician can be studied in detail and the completed dentures observed and evaluated.

The Prosthetic Dental Service Committee recommends this clinic to dental societies to improve the quality of service which their members render to the public.

THE RESPECTIVE RESPONSIBILITIES OF THE DENTAL PROFESSION AND THE DENTAL LABORATORIES

In the past, dental laboratories have been looked down upon as "commercialists," a term which implies that the laboratories merely buy and sell products. Actually, the technician buys materials and sells his service, just as the dentist buys material for operative work. He has become an adjunct to the practice of prosthetic dentistry. The laboratory owner is an "industrialist" who sells his services on order or prescription, through processing a product, and like anyone else he may decide to conduct his business along ethical or unethical lines.

The laboratory owner who chooses to be ethical must set up standards for service in dealing with his clients and should try to make the clients recognize what these standards can mean to them in reputation and in income. Unless there can be an understanding of the necessity for cooperation even in apparently unimportant details, many opportunities for giving fine service will be missed.

There are visible losses in conducting a laboratory or a dental practice for which correction or allowance can be made. There are also sources of loss which are less visible or wholly unrecognized. Long experience has shown that, in the plastic full denture department of dental practice and laboratory conduct, the all-too-frequent remaking of dentures might be called "the avenue of losses" for both dentists and technicians. A study of the respective responsibilities of the dental profession and the dental laboratory will create a better understanding of the causes of remaking and resetting dentures and will save much time and trouble for all concerned.

Many dentists seem to believe that the processing and other work done in the laboratory are responsible for the dentures that must be remade. This is not necessarily true. An error by either the dentist or the technician can be the cause.

Dentists are inclined to underestimate the cost to the laboratory of remaking dentures. The fee charged by the laboratory is based on the cost of labor plus overhead, and rarely provides for more than 10 per cent net profit. The margin of $2 on a $20 item is so small that there is no allowance for error on the part of either the technician or the dentist. The busy dentist cannot afford to have dentures remade because of the demands for his services, and the laboratories cannot afford to remake dentures because of the financial loss.

There are eight major reasons why dentures must be remade: (1) incorrect impressions; (2) incorrect jaw relations, either centric or vertical; (3) centric relation registered on base plates which have shifted in the mouth at the time of registration (this magnifies the error when the case is mounted); (4) warped occlusion rims which rock in the mouth or on the cast; (5) incorrect processing; (6) incorrect shades and molds; (7) incorrect treatment planning (treatment planning includes proper preparation for occlusal rests, relief of hard areas, etc.); (8) incorrect selection of the material for the case.

Many impressions are incorrect because of the failure of dentists to study mouth anatomy and properly to appreciate the need of varying their technic to meet individual require-

ments. Favorable or unfavorable placement of soft tissues (not pressure) will mean the difference between success and failure in many cases. The difference between a post dam and a post seal will often influence the success of a case. Often the best-looking impression is the poorest. It is for this reason that the dentist should avoid making the customary request that the laboratory accept or reject an impression by looking at it. Much trouble could be avoided if the dentist would outline his impressions or cast to indicate the periphery of the finished denture. The dentist should record, by accurate observation on the cast or in his prescription, the hard and soft areas in the mouth which support the dentures.

Registering centric and vertical relations is definitely the responsibility of the dentist. It is a mouth procedure which involves an understanding by the dentist of the mechanics of mandibular movements and of esthetics. The difficulties in this phase of the work could be reduced by the use of adequate procedures. A recent poll conducted by the *Dental Survey* shows that dentists use the following methods for registering centric relation: 74 per cent, bite plates or bite blocks of wax; 9 per cent, wax bites; 17 per cent, gothic arch tracings. The gothic arch tracing is the most accurate, and the wax bite is the least accurate. The use of bite plates is also subject to great errors if the technic of the operator is not perfect and if due consideration is not given to the contraction of the wax.

Uneven heating of wax occlusal planes will cause uneven displacement of tissue, and the recording will be incorrect when mounted on the articulator. The wax bite should never be used, except as a means of mounting casts for the purpose of preparing biterims that will save the operator's time when using tracing devices. The technician has no means of knowing whether or not the jaw relationship is correct, except by observation of the imprint of teeth on biterims.

When the teeth have passed through a greater quantity of wax on one side than on the other, it usually indicates a shifted base plate, caused by a lateral or forward movement of the mandible. The technician has no means of knowing whether the vertical dimension is correct or not, except by the parallelism of the ridges, a criterion which is not infallible.

Shifted base plates at the time of registration may be caused by carelessness on the part of the operator or by inadequately fitted occlusion rims. The occlusion rims may be improperly formed by the technician, in which case the dentist guesses as to the position of the plate in the mouth and the technician guesses as to its position on the cast. This is probably the most frequent cause of recording incorrect relations. The responsibility falls on both the dentist and the technician. The dentist may warp occlusion rims by improper handling and heating of the occlusal plane. Many dentists fail to test the accuracy of fit of biterims on the casts after completing the operative procedure.

Warped occlusion rims require the technician to guess as to the position of the plate on the cast. A careful study discloses that almost 50 per cent of the base plates sent to the laboratories are warped and will not reseat accurately on the cast.

Errors in mounting cases because of distortion of wax or warpage after the records are made cannot be blamed on the technician. The same type of error results from distorted wax check-bites, or from the use of a large bulk of wax to register jaw relations for either full or partial dentures. The dentist should take precaution to avoid the necessity for any guesswork on the part of the technician.

Processing errors are avoidable by the technician. They result from: (1) poor equipment, such as bent flasks and powerful presses; (2) improper flasking materials; (3) overpacking; (4) overpressure or too rapid flask closure; (5) failure to close flasks completely (too weak springs); (6) bending or warping of partial dentures in finishing and polishing; (7) failure to maintain the vertical dimension furnished by the dentist. The use of dividers is suggested to prevent this last error. The injection technic will remove any chance of error under the first five conditions.

The selection of shades and molds is the responsibility of the dentist. The technician does not see the patient, and therefore can have no way of determining whether or not the choice of shade or mold is correct. The variation of shade guides makes it necessary for the dentist to send the shade guide tooth (not the number) to the laboratory, particularly for jacket crowns and porcelain or acrylic bridge work. The custom of sending patients to the laboratory to fix the responsibility is wrong from

both the legal standpoint and the expense to the laboratory.

The entire treatment plan should be made by the dentist, as this is his responsibility. Relief for hard areas under full dentures must be clearly outlined on the cast. The technician cannot accurately make this observation. The same is true for the denture outline and for the post dam.

The dentist must make all necessary preparations of teeth for partial dentures before taking the impressions. This includes the shaping of the teeth when they are in malalinement and the preparation of rest seats for occlusal rests. The dentist should determine also the teeth to be clasped. Reports indicate that proper disk-like preparations for occlusal rests will take occlusal and lateral strains and will prevent decay. Occlusal rests placed on the marginal ridge of a posterior tooth will often invite decay and throw greater strain on clasp arms.

A careful survey discloses that almost 50 per cent of cases sent to the laboratories have no preparation for occlusal rests. The technician does not have access to the mouth and can only work on the casts furnished by the dentist. The dentist alone is trained to know which teeth can support clasps or occlusal rests, because he alone knows the condition of the supporting structures of the teeth. The dentist must select the material to be used for the individual case, because he alone knows the condition of the remaining teeth, the type of filling material in these teeth, the type of mucous membrane and other factors essential to this selection for each case. It is a fact, however, that a large majority of the profession expect the technician to make these decisions, and, if the denture is not satisfactory, they hold him responsible.

The dentist and the dental technician must each recognize his respective responsibility in furnishing the ultimate ideal dental service to the public. When both the dentist and the dental technician accept this responsibility, the quality of service will be improved.—*Samuel G. Supplee, 17-19 Union Square, New York 3.*

Dentistry and Insurance.—In considering the applicability of the insurance principle to payment of dental costs, the nature of insurance in general must be kept clearly in mind. It consists of payment of stated premiums in return for which, if certain contingencies take place, the individual will be reimbursed for costs or losses involved—out of the accumulated premium of many persons. It is always the unknown that is insured against, never the known; and thus it is clear that insurance cannot be a solution of the (dental) initial cost problem. Initial care needs are already present and, within narrow limits, costs of providing for them can be estimated after inspection of the mouth and taking a full mouth x-ray series. Therefore initial dental care is uninsurable even as a house that has burned down, or a fur coat that has been stolen, is no longer insurable.—*Dental Care for Adults Under Clinical Conditions. Dorothy Fahs Beck. American College of Dentists, 1943, p. 269.*

BOOK REVIEWS

Dentistry: An Agency of Health Service. By Malcolm Wallace Carr, D.D.S. Contributors: James E. Aiguier, Ph.G., D.D.S.; Robert Whitney Bolwell, A.B., A.M., Ph.D.; Otto W. Brandhorst, D.D.S.; H. Trendley Dean, D.D.S.; Russell A. Dixon, D.D.S., M.S.D.; James M. Dunning, A.B., D.D.S.; William B. Dunning, D.D.S.; H. Shirley Dwyer, D.D.S.; William J. Gies, Ph.D., Sc.D., LL.D.; Robert R. Gillis, D.D.S.; Harlan H. Horner, M.A., Pd.D., LL.D.; Daniel F. Lynch, D.D.S.; Sterling V. Mead, D.D.S., B.S., M.S.; Arthur H. Merritt, M.S., D.D.S., Sc.D.; Lon W. Morrey, D.D.S.; George C. Paffenbarger, D.D.S., D.Sc.; J. Ben Robinson, D.D.S., D.Sc.; Clyde H. Schuyler, D.D.S.; and C. Raymond Wells, D.D.S., Sc.D. 210 pages. Cloth. Price $1.50. New York: Commonwealth Fund, 1946.

For many years there has been a great need for a short, panoramic survey of dentistry in the United States. That need is now fulfilled in this volume which is published as one of a series of "Studies of the New York Academy of Medicine and the Changing Order." Nineteen authoritative commentators in various fields of dentistry have contributed to this monograph which plainly reveals the competent editing and synthesis of Malcolm W. Carr.

The basic purpose of this book is to relate dentistry to "national health in a changing social order." But more than this has been achieved. The progress of dentistry from a biomechanical craft to a profession is traced in the section dealing with history. Dental education of the past and present is realistically analyzed in terms of its victories and its problems. An extensive section on dental practice includes discussions on hospital dental service, public health dentistry, dentistry for Negroes, preventive dentistry and other associated topics. There are good chapters on research and on dental socio-economics.

All of this makes good and interesting reading, though there is some unevenness in the various sections. National legislation, for example, is discussed almost entirely in terms of current problems, and the important achievements of the past are not emphasized. In the section on dental practice, twenty-six pages are given to a thorough-going discussion of hospital dental service, eleven to dentistry in industry and only two to public health dentistry. In a volume that aims to relate dentistry to a changing social order, it would seem almost imperative to have a more important presentation on the programs, mechanisms and objectives of public health dentistry.

There is no evasion of forthright statements on controversial problems, and in itself this should be a matter for congratulation. In the discussion of whether or not dentistry should be a part of medical practice, this conclusion is reached: "The validity of the independent dental educational system and the inherently special character of dental art, which have been evolved through centuries to meet the needs of society for a peculiar type of health care, should be accepted as proof that continuance of dental autonomy is imperative." There are many other cool evaluations of difficult problems, and even the casual reader must conclude that a sincere attempt was made to analyze dentistry and dental problems in terms of reality.

The summary and conclusions present an excellent restatement of the theme which informs all preceding chapters: American dentistry, largely through its own efforts, has made enormous progress in a single century, but an examination of present problems immediately discloses that there is no place for complacency that leads to inactivity. In the particular frame of reference in which this book is set, the following conclusions may be interesting to those who must plan for dentistry's participation in a changing social order which inevitably must include more health care for more people:

"An attempt to provide complete dental health service for everybody in the United States would at present be impractical and unsuccessful. . . . But a dental health plan that would be initiated experimentally and at first be restricted geographically, and which

would concentrate on children (three to eighteen years), would have important direct health and educational benefits. Such a plan would be limited in scope; it would be successful as to both payment of cost and adequacy of the number of dentists to meet the demand; and it would have family appeal, popular acceptance, public support, and approval of the dental profession. The proposed systematic dental health care, if continued throughout childhood, would favor the arrival in early adult life at a condition of sustained dental health, which thereafter—if adequate care were continued recurrently—would involve only maintenance costs. Thus an actuarial basis would be provided for a general insurance plan for dental care in subsequent years and for future generations."

Many readers will also be impressed by the fact that many of the chapters would lose their substance if it were not for the programs and achievements of the American Dental Association. It is remarkable that its influence is so clearly seen in all of the sections that deal with the progress of dentistry in the United States. This fact will provide a permanent and telling answer to those few who maintain that professional organizations are established for the exclusive protection of the practitioner and not that of the public.

Dentistry: An Agency of Health Service is required reading for every dentist. It should also be required reading for every physician and public health worker, for it will do much to bring about that desirable integration and cooperation of all agencies which play a part in health planning.

The Physician's Business. By George D. Wolf, M.D., assistant clinical professor of otolaryngology, New York Medical College, New York. Ed. 2. 433 pages. 58 illustrations. Philadelphia: J. B. Lippincott Company, 1945.

The author of *The Physician's Business* in his second edition has succeeded admirably in meeting the business problems of the physician with a presentation which is simple, lucid and intelligent.

In the opening chapter the author stresses the importance of the hospital internship of the graduate, and discusses methods of appointment, choice of hospital and the moot question of the preference of a rotating or straight internship.

In the second chapter suggestions for other fields of medicine are offered to the graduate who is temperamentally unsuited to private practice. Included in this list are the federal public health services, aviation medicine, the merchant marine, civil service and insurance medicine.

"Specialization" is the title of Chapter 3, and the author notes, with interest, the impetus to the division of function during the past hundred years. The reasons for growth of specialization, the number of specialists, the income of specialists, the location and selection of specialties and finally the recent trend away from specialization are thoroughly discussed. The problem of locating an office is discussed in Chapter 4.

Chapter 5, "Professional Contacts," discusses the ethical conduct of the physician, including his obligation to his patients, his relations with colleagues, publicity, hospital and dispensary affiliations and consultations. This chapter is exceptionally good. The importance of medical societies and medical journalism is also elaborated upon.

In the chapter "The Doctor and His Patient," the author presents (in part 1) an extensive and complete set of daily record cards, case histories, case records and financial accounts. Part 2 is concerned with the question of fees, including establishment of just fees, collection of fees, free consultations, credit and collection agencies and courtesy services. To give a fundamental idea of customary charges, the author presents a fee schedule which is used in connection with the Workmen's Compensation Law, as suggested by a committee of insurance carriers and the Committee on Medical Economics of the Medical Society of the State of New York.

The final chapters are devoted to planning and equipping an office, office personnel, technics, surgical instruments, forensic medicine, income taxes, insurance, current trends in medical practice, prepayment health (or sickness) insurance and workmen's compensation laws.

By a careful perusal of this book the recent graduate as well as the more experienced practitioner can solve many of the problems with which he is confronted today. The author is to be congratulated on the high standard of the factual information.—*Lloyd H. Dodd.*

CURRENT LITERATURE

The Numbers and the Sites of Origin of the Droplets Expelled During Expiratory Activities. J. P. Duguid. Edin. M. J. 52:385, 1945.

The numbers of droplets expelled during normal breathing, strong nasal expiration, laughing, speaking, coughing and sneezing were estimated by four different methods: (1) counting colonies on culture plates exposed directly to droplet spray; (2) counting droplet stain marks on slides exposed directly to droplet spray; (3) counting colonies on culture plates exposed in the Bourdillon slit sampler; and (4) counting all microscopically visible droplet nuclei found on oiled slides exposed in the slit sampler. Study of site of origin of droplets was made by inoculation of certain areas with B. prodigiosus. Speaking, coughing and sneezing produce very many droplets small enough to remain air borne as droplet nuclei. Nearly all of these small droplets originate from the front of the mouth. Only relatively few, if any, originate from the nose, as in sneezing and breathing, or from the throat, as in sneezing, coughing, speaking and laughing. The extent of the air-borne infection which may be produced by the droplet spray of infected persons must depend largely on the frequency with which pathogenic organisms, especially large numbers of these, are present in the secretions of the anterior mouth. According to the little information available, this frequency does not appear to be great. More information is needed about the occurrence in the anterior mouth secretions of the different pathogenic organisms.—*J. E. Gilda.*

Forsyth Orthodontic Survey of Untreated Cases. E. I. Silver. Am. Assoc. Orthodontists, Forty-Second Annual Meeting, April 1944.

A report is made of the orthodontic research survey of untreated cases at the Forsyth Dental Infirmary covering a period of more than ten years. The growth and development of the teeth and jaws were observed regularly in cases without orthodontic intervention. The following points were especially noted: general health, diet, hereditary characteristics, muscle habits and occlusion. Each patient had impressions taken for casts and submitted himself for a complete history and thorough roentgenographic and photographic examinations.

From the data collected the following conclusions may be drawn: 1. Observation should start as early as possible because of the high incidence of malocclusion. 2. Faulty habits (thumb sucking, etc.) are factors definitely affecting a deviation from the normal occlusion and should be discouraged at all ages. 3. All open bite tendencies should be observed to determine the direction of growth and proper treatment should be instituted. 4. Importance of space maintenance in the premature loss of deciduous teeth cannot be overstressed. 5. Mesial or distal relationship of the arches has very little chance for improvement without orthodontic aid. 6. General systemic data, hereditary background and nutritional influence are indispensable adjuncts.—*Hyman Goldberg.*

Studies on the Rate and Amount of Eruption of Certain Human Teeth. H. Carlson. Am. Assoc. Orthodontists, Forty-Second Annual Meeting, April 1944.

The mandibular central incisor, the cuspid, the first and second bicuspids and the permanent first molar were studied. The method employed was serial cephalometric roentgenography followed by the tracing and measuring of certain points on the teeth in relation to the lower border of the mandible, the structure which was used as a plane of reference.

The findings can be summarized as follows: 1. Without exception, the teeth studied showed a constant increase in the distance between the tip of the crown and the lower border of the mandible regardless of age. 2. During the period of crown formation of some teeth, notably the lower cuspid, there was constant decrease in the distance between the lower border of the mandible and the open or forming end of the crown. In others, the open end maintained approximately the same distance between the points. 3. Coincident with the beginning of root formation the distance be-

tween root end and mandibular border invariably decreased; the amount of this downward growth was found to be 2 to 4 mm. 4. After the downward growth of the root there was a period of rapid eruption of the teeth during which all points on the teeth were seen to increase their distances from the mandibular border. Such distances did not increase equally, eruption proceeding more rapidly than root formation. 5. The period of rapid eruption continued until the tooth came into occlusion, and subsequently the tooth erupted only as rapidly as the occlusal plane rose. 6. Coincident with the attainment of occlusion, root formation was completed by a decrease in the distance from the mandibular border. 7. Once the root was completed the entire tooth again moved upward at the same rate as that of the occlusal plane. 8. Rate of eruption was markedly different in different teeth, and values for the same tooth varied in different persons. 9. Greatest rate of eruption occurred in the lower second bicuspid; greatest rate of eruption for any one-year period, in the lower central incisor; greatest rate of eruption for any two-year period, in the lower cuspid. 10. Increase in the rate of eruption takes place long before clinical emergence of the crown; clinical emergence does not influence the rate of eruption. 11. Rapid eruption of the tooth does not start until the crown is fully formed.—*Hyman Goldberg.*

Restoration of Upper Anterior Teeth with Gold Inlay and Porcelain. Earl H. Zimmer. J. Colorado D. A. 23:120, June 1945.

The author proposes the use of a gold inlay, with a labial veneer of porcelain, acrylic resin or silicious cement, for replacing tooth structure which includes the proximo-incisal angle. The incisal edge is covered entirely by the casting, and an incisal retention pin is placed laterally from the cavity into a thicker portion of the tooth. A sharp bevel to the lingual surface, with little tooth substance removed from the labial surface, prevents an undesirable display of gold.

The outline form of the proximal aspect is carried laterally to remove the overhanging enamel. Retention is secured by a square gingival seat and by making a fairly shallow groove to the incisal aspect with a tapering, crosscut fissure bur. This is supplemented with a retention pin at the end of the groove into the gingival seat. The usual pattern is made, and attention is given to the flow of wax into the pin holes and to the carving of the labial window. After casting, the labial window is filled with porcelain, acrylic resin or silicious cement veneer. The author believes that this restoration is more conservative than a porcelain jacket crown for proximo-incisal angles and that it has the added advantage of greater strength.

Congenital Abnormalities in Infants Following Infectious Diseases During Pregnancy, with Special Reference to Rubella. A Third Series of Cases. Charles Swan and A. L. Tostevin. M. J. Australia 1:645, May 1946.

In the course of the present examination, fifty-six infants and two fetuses were examined, forty-six of whom were found to have congenital malformations. In forty instances in which the mothers had suffered from rubella in pregnancy, thirty-six of the infants and one fetus exhibited congenital defects. The abnormalities comprised eleven cases of deaf-mutism, eleven cases of deaf-mutism and heart disease, as well as other cases or combinations of deafness, strabismus, cataract, nevus, speech defect, lack of closure of the fetal fissure, mongolism, microcephaly, cleft palate, spina bifida occulta, hypertrophic pyloric stenosis, spastic diplegia and inguinal hernia. Four of the mothers had had German measles in the first month of pregnancy, nineteen in the second month and eight in the third month; two in the fourth month and one each in the fifth, sixth and eighth months. In the remaining case, the duration of pregnancy at the time of infection was not determined. In three cases in which the infant born subsequently was normal, the mothers had contracted the disease in the second, fourth and sixth months of pregnancy, respectively.

In the two cases in which rubella was contracted less than a fortnight before conception, the offspring were apparently normal. The infectious diseases during pregnancy in the remaining sixteen cases included eight cases of morbilli (two of the babies were normal), two cases of herpes zoster (both of these babies exhibited abnormalities) and one case of scarlet fever (the baby was defective).—*S. W. Leung.*

Changes in the Central Incisors of Hypophysectomized Female Rats After Different Postoperative Periods. H. Becks, D. A. Collins, M. E. Simpson and H. M. Evans. Arch. Path. 44:457, May 1946.

Roentgenographic and histologic studies were made of the incisors of 141 hypophysectomized female rats, killed at intervals between 6 and 664 days after operation. The earliest change in the upper incisor detected by roentgenography was thickening of the labial and lingual dentin at the expense of the pulp chamber. This alteration occurred at fourteen and eighty-seven days, respectively, after hypophysectomy and was the only constant and pathognomonic symptom observed. Distortion of the apical labial curvature, distinct folding of the upper incisor alone and folding of both upper and lower incisors were first seen 100, 144 and 205 days, respectively, after hypophysectomy. None of these findings was pathognomonic.

The folding of the upper incisors alone was seen most frequently (in 46 per cent of rats 144 or more days after hypophysectomy). Folding of the lower incisors was present in only thirteen of the forty rats which showed folding of the upper incisors. It never occurred in lower incisors without simultaneous folding in the upper teeth. Histologic examination was limited to animals with long postoperative intervals. The most outstanding change in cellular structures occurred in the ameloblastic layer. The regressive changes were not uniform for all animals but were directly proportionate to the severity of distortion or folding of the apical tissues. Degeneration of the odontoblasts began in the incisal portion of the incisor and reached the apical end only in animals that showed advanced folding. Marked diminution in the vascularity of the pulp also characterized the advanced changes. Increase in the thickness of cementum was observed in all hypophysectomized animals.—*J. E. Gilda.*

Recording the Frankfort-Mandibular-Plane Angle Using Oriented Mandibular Radiogram and Sectioned Oriented Cast. Bercu Fischer. Angle Orthodont. 15:30, January-April 1945.

Among the various factors responsible for facial form, the postural inclination of the mandible as related to the cranium and the procumbency of the incisors seem to play an important part. These relationships can be measured by means of the angle formed by the Frankfort plane and the lower border of the mandible, and the angle formed by the lower incisors and the lower border of the mandible. These angles are recorded by means of a graph obtained from an oriented mandibular roentgenogram and an oriented sectioned mandibular cast. Four angles are recorded. These angles are of diagnostic value in determining whether the procumbency of the mandibular incisors is due to: (1) the relationship between the incisors and the lower border of the mandible, (2) the relationship between the lower border of the mandible and the Frankfort plane or (3) both. By means of three of these angles and their relationships, it is possible to ascertain the site and degree of change in the axial inclination of the mandibular incisors produced by orthodontic treatment.

The roentgenographic technic has some new featues. A metal wire identifies the crown axis of the incisor tooth whose angle is to be recorded and shows the relationship of the root of this tooth to the surrounding bone. The operation can be repeated with each incisor tooth and the average axial angle obtained.

Bismuth Pigmentation: Its Histochemical Identification. M. Wachstein and F. G. Zak. Am. J. Path. 22:603, May 1946.

Castel's method for the demonstration of bismuth in tissue preparations was adopted for the identification of bismuth sulfide in frozen sections, in paraffin sections and in gross specimens. The tissue is treated with hydrogen peroxide; bismuth sulfide is transformed to the sulfate which is then treated with a solution of brucine sulfate and potassium iodide thereby producing an orange-red material. Bismuth discoloration of the colon is apparently not infrequent since it was found in four of 340 consecutive autopsies. Injection of even small amounts may lead to the deposition of histochemically demonstrable sulfide in the large bowel. Microscopically, the pigment is found in the superficial mucosa, particularly in capillary epithelium and histiocytes. Certain inclusions in renal epithelium cells gave a positive reaction. Pigmentation of the tonsillar mucosa was noted.—*J. E. Gilda.*

The Effect on the Tooth Flora of the Rat of Immunization Against Lactobacilli and Acidogenic Cocci. Elizabeth T. Parsons, E. J. McCollum and Martin Frabisher, Jr. Am. J. Hyg. 43: 41, 1946.

Studies were carried out to determine whether or not immunization of rats with autogenous vaccines of Lactobacilli and acidogenic cocci has any demonstrable effect upon the flora from the crypts and fissures of the teeth themselves. Living vaccines from four strains of Lactobacilli and five strains of acidogenic cocci isolated from the crypts and fissures of the molar teeth of normal rats were used. Two groups of experiments using thirty rats in each group were carried out with two experiments in each group. All experimental animals were given nine subcutaneous injections of the vaccine at two to three day intervals in amounts varying from 0.2 ml. to 1.8 ml. followed by four intraperitoneal injections of 2.0 ml. each. The results indicated that the numbers of Lactobacilli and acidogenic cocci found in the fissures and crypts of the teeth of the injected rats did not differ significantly from those found in the unvaccinated animals.—*S. W. Leung.*

The Multiplicity of Foramina Mentalia in a Human Mandible from the Copper Age of Anatolia. M. S. Senjürek. Nature 157:792, June 15, 1946.

The discovery of a mandible from the copper period of Kusura with four or five foramina has led to an evolutionary study of the foramen. Comparative data are given which indicate that the mutiplicity of foramina mentalia is a primitive feature of the hominids, and that during the course of human evolution there has been a tendency to reduce the number of the foramina. This tendency appears to have culminated in recent man, most of whom have a single foramen with a relatively small amount of variation.—*Hyman Goldberg.*

Osteoradionecrosis of the Mandible. E. A. Lawrence. Am. J. Roentgenol. 55:733, June 1946.

A series of six cases is reported. The importance of heavy irradiation, infection and trauma in the pathogenesis of osteoradionecrosis is discussed. The author believes that a period of ten days should elapse between the extraction of teeth and initiation of radiation therapy, during which time healing will have begun in the socket. Therapy should be conservative until sequestration occurs. The sequestration can then be removed easily without surgical intervention. An involucrum, in the ordinary meaning of the word, probably does not form but there is present a fibrous union between bad and normal bone.—*Hyman Goldberg.*

Mounting Study Models for Diagnosis and Visual Conception of Prospective Tooth Movements Previous to Treatment. Charles A. Spahn. Angle Orthodont. 14:71, July-October 1944.

The uncertainty of clinical and model examination at the beginning and during the application of treatment prevails generally throughout orthodontic literature and practice. Six or seven analytical and diagnostic signs have been plainly called to our attention in the literature of today, but there still exists a great variation of opinion on all of these points.

A method is described in which teeth are mounted and then cut off of the orthodontic model and reset into ideal positions. This method has designated and clarified the correct movements required in orthodontic treatment. In the hands of widely distributed practitioners, the results of the analysis do not vary greatly.

Asymmetry in Tooth Size: A Factor in the Etiology, Diagnosis and Treatment of Malocclusion. Murray L. Ballard. Angle Orthodont. 14:67, July-October 1944.

Measurements of the mesiodistal width of permanent teeth, right and left, were taken from 1,000 plaster models (500 cases), using sharp-pointed dividers and a millimeter scale. Discrepancy in size between right and left paired teeth was particularly noted, disregarding those discrepancies of less than 0.25 mm. Discrepancies greater than 0.25 mm. were found in 90 per cent of the cases, and discrepancies greater than 0.50 mm. were present in more than half of the cases. Such findings cast serious doubt upon the commonly held belief that the human dentition is a potentially perfect and balanced machine. Means and standard deviations for each tooth are given, and are compared with the means of G. V. Black.

LIST OF DENTAL OFFICERS

SEPARATED FROM ARMY DENTAL CORPS

THE following list of dental officers separated from the Army Dental Corps does not include rank because such information is no longer furnished by the Surgeon General's Office. Publication will be given to other names as soon as possible.

Alabama

Birmingham	Coffman, Michael R.
Birmingham	Vann, George W.
Decatur	Johnson, Thomas H., Jr.
Elkmont	Webb, Luther
Mobile	Geary, Thomas J., Jr.
Mobile	Van Antwerp, Sidney P.

Arizona

Bisbee	Fergus, Robert
Glendale	Conway, Raymond W.
Phoenix	Boynton, Charles E.

Arkansas

El Dorado	Henry, Howard T.
Little Rock	Nowak, Thaddeus J.

California

Bakersfield	Cuneo, Peter J., Jr.
Canoga Park	Keller, Joseph H.
Dinuba	Collins, Asa W., Jr.
Fairfax	Grimwood, Frank G.
Fresno	Barr, Edward J.
Inglewood	Landen, Andrew F.
Loma Linda	Marin, Harold L.
Long Beach	Baskin, Bernard
Long Beach	Bundy, Robert V.
Los Angeles	Atlaffer, Harry C.
Los Angeles	Childs, Herbert G., Jr.
Los Angeles	Dixon, Donald M.
Los Angeles	Isgur, Albert H.
Los Angeles	Juline, Carl
Los Angeles	Kniss, Clay P.
Los Angeles	Koran, Aaron B.
Los Angeles	Lasken, Melvin
Los Angeles	MacArthur, M. Hebbard
Los Angeles	Park, Wilder F.
Los Angeles	Sherman, Harold E.
Los Angeles	Spicer, Howard E.
Manteca	Grant, Benere H.
Merced	Lewis, Earl A.
Mill Valley	Tanner, Lorne A.
Oakland	Atkinson, Leander B.
Oakland	Benson, Jesse M.
Oakland	Borello, Frank J.
Redwood	Mervy, Emile D.
Sacramento	Johnson, George P.
Sacramento	Radonich, Victor G.
Sacramento	Wong, Shue F.
San Diego	Swag, Gustav
San Francisco	Brady, Thomas H., Jr.
San Francisco	Dunn, Arthur E.
San Francisco	Edelstein, Robert L.
San Francisco	Gliebe, Francis J.
San Francisco	Hasert, Emil C.
San Francisco	Hyman, Edwin J.
San Francisco	Ling, Leonard L. F.
San Francisco	Paolucci, Alfred S.
San Francisco	Price, Leo W.
San Francisco	Speckens, Joseph A., Jr.
San Francisco	Tackney, James F.
San Francisco	Valente, Andrew F.
San Jose	Gattuccio, Ignatius
San Leandro	Vecchiarelli, Carlo E.
San Marino	Fulcher, Robert L.
Santa Barbara	Heimlich, Albert C.
Santa Clara	Rogers, Robert J.
Santa Monica	Kuehnert, Arno J.
Santa Monica	Pruden, Robert L.
Stockton	Linn, Leonard D.
Vallejo	Brownridge, George W.
Vallejo	Rowe, Ernest M.
Venice	Borden, Isidore
Woodland	Avary, Hugh D.

Colorado

Boulder	Howe, Donald C.
Colorado Springs	Bryant, Mark F.
Colorado Springs	Downs, Bertram H.
Colorado Springs	Steahlin, Paul K.
Denver	Bell, Herbert O.
Flagler	Zink, Carl W.
Grand Junction	Eames, Wilmer B.
Greeley	Woodward, Harold S.
La Junta	Rowden, Fred A.
Trinidad	Foster, Bernie U.

Connecticut

Bridgeport	Fass, Elias N.
Cheshire	Chapman, John N.
Danbury	Schoen, George J., Jr.
Hartford	Westerberg, Carl V.
New Britain	Cohen, Sol J.
New Britain	Lobo, Joseph M.
New Haven	Hertz, Aaron R.
New London	Zuckerman, Avery E.
Stamford	Weisberg, Saul
Torrington	Houlihan, John J.
Torrington	Temkin, Abraham
Waterbury	Membrino, Ottone R.
West Haven	Ritch, Irving

Delaware

Frankford	Carey, Asher B., Jr.
Wilmington	Goodman, Joseph
Wilmington	Weinstock, Leonard G.

District of Columbia

Washington	Amato, Samuel D.
Washington	Bernstein, Norman N.
Washington	Childress, William C.
Washington	Ditzler, Norman W., Jr.
Washington	Friedman, Abraham
Washington	Hussong, Frank R., Jr.
Washington	Sembekos, Harry S.

Florida

Miami	Fry, Harry E., Jr.
Orlando	Chace, Richard
Tallahassee	Cogswell, Robert C.

Georgia

Atlanta	Briscoe, William H.
Atlanta	Chaite, Louis J.
Augusta	Fender, John B.
Cartersville	Choate, Harold J.
Colquitt	Brooks, Thomas I.
Decatur	Avery, William E., Jr.
Decatur	Garvin, Finley
Decatur	Hastings, Stanley M.
Ocilla	Curran, William E.
Sandersville	Cason,Raleigh C.
Savannah	Meyer, Cord

Hawaii

Wahiawa	Ream, Willliam M.

Idaho

Boise	McCabe, Robert J.

Illinois

Anna	Keith, John R.
Argo	Kunik, Paul J.
Belleville	Bischoff, Leon A.
Belleville	Wilderman, Malbern N.
Berwyn	Keiser, Isaac B.
Berwyn	Mulacek, Emil
Berwyn	Tolar, William F.
Centralia	Baldwin, Richard C.
Chicago	Albino, Joseph N.
Chicago	Albrecht, Robert A.
Chicago	Bayer, Sidney D.
Chicago	Berg, Howard S.
Chicago	Brady, William B.
Chicago	Braun, William E.
Chicago	Bruzas, Ben C.
Chicago	Burner, Dee K.
Chicago	Cedar, Warren R.
Chicago	Ciebien, Martin
Chicago	Covington, George E.
Chicago	Decker, Jack A.
Chicago	Ditkowsky, Maurice A.
Chicago	Dvork, Charles W.
Chicago	Estrin, Seymour M.
Chicago	Frey, Glen E.
Chicago	Friedrich, Rudolph H.
Chicago	Garfield, Louis M.
Chicago	Gershenfeld, Carl
Chicago	Goldfield, Samuel
Chicago	Hill, Louis H.
Chicago	Hoenig, Herbert H.
Chicago	Horn, Bernard
Chicago	Jacobson, Emanuel E.
Chicago	Jacobson, Louis
Chicago	Knudtzon, Kermit F.
Chicago	Koplan, Robert
Chicago	Krashen, Avery S.
Chicago	Kubala, Paul A.
Chicago	Lattman, Peter A.
Chicago	Lieberman, Samuel Z.
Chicago	Madda, Carl J.
Chicago	Maxwell, William L.
Chicago	Mitchell, David F.
Chicago	Pritikin, David
Chicago	Rosenthal, William
Chicago	Scudder, Joseph M.
Chicago	Seidl, Ralph R.
Chicago	Siegel, Elmar A.
Chicago	Tiersky, Morris D.
Chicago	Trampota, JosephT.
Chicago	Valentinas, Walter L.
Chicago	Waller, Roy E.
Chicago	Wechsler, Jack
Chicago	Zerdun, Rudolph G.
Chicago Heights	Eberly, Glenn H.
Cicero	Klenha, Harold J.
Cicero	Kubik, Joseph E.
Des Plaines	Heller, William F.
East St. Louis	Flannery, Vincent W.
Elmhurst	French, Stephen F.
Elmo	Mitchell, Hubert A.
Galesburg	Fell, Rannald H.
Granite City	Geroff, Vladimir K.
Mason City	Price, Virgil E.
Minier	Kenward, Edward F.
Mt. Vernon	Whitaker, Reginald H.
Oraville	Birkner, Edward H.
Peoria	Baldwin, Mark R.
Peoria	Barclay, Willis O.
Peru	Boyer, Robert M.
Quincy	Haller, Karl W.
River Grove	Mortensen, Alfred N.
Rockford	Veline, Aleard H.
Rock Island	Hainline, Forrest A.
Springfield	Davis, Alvin E.
Vienna	Johnson, Franklin A.
West Chicago	Keppler, John W.

Indiana

Anderson	Hunt, John C.
Gas City	Hinesley, Dale E.
Hammond	Levin, Saul S.
Hammond	Raycraft, Kingston F.
Indianapolis	Jordan, Dick H.
Indianapolis	Renshaw, Lowell R.
Union City	Lytle, Joshua W.
West Baden Springs	Gromer, Roscoe L.

Iowa

Calumet	Mehrens, Donald M.
Carroll	Barels, Robert F.
Centerville	Johnston, Sidney E.
Centerville	Roland, John M.
Des Moines	Avenell, Rollin C.
Des Moines	Krick, Louis F., Jr.
Glenwood	Bates, William W.
Iowa City	Blackman, Jay V.
Iowa City	Donohue, John L.
Iowa City	Hagemeister, Carl R.
Iowa City	Patton, Edward C.
Iowa City	Underkofler, Thomas A.
Iowa City	Williams, Lloyd E.

Lake Park	Miller, Max E.
Lansing	Hintz, Robert H.
Pella	Bosveld, Fred
Victor	Bellegante, Louis

Kansas

Concordia	Bothe, Christopher J.
Kansas City	Burcham, James W.
Kansas City	Dukes, Howard H.
Kansas City	West, Robert K.
Onaga	Brown, Forrest A.
Pittsburg	Crowder, Arthur L.
Wichita	Fulton, Albert E.
Wichita	Helitzer, Bernard

Kentucky

La Grange	Smith, Edward P.
Lawrenceburg	Hensley, Robert W.
Louisville	Beck, Franklin B.
Louisville	Colombo, Joseph N.
Louisville	Hansberry, Howard L., Jr.
Louisville	Pierson, Glen R.

Louisiana

Baton Rouge	Girod, Clarence E., Jr.
Bogalusa	Daniel, Claude P.
Bogalusa	Goldman, Leonard N.
Columbia	Hill, Luther D.
Erath	Suire, Leroy G.
New Orleans	Bowman, Henry L.
New Orleans	Dardis, William J.
New Orleans	Soniat, Sidney L.
Oberlin	Karam, Paul
Ringgold	Lawhead, Charles W.
Rodessa	Eubanks, Roy J., Jr.
Shreveport	Forbing, Harold S.
Shreveport	Siess, Harry J., Jr.

Maine

Auburn	Miller, Lester
Bath	Levin, Jesse H.
Portland	Brownstone, David I.
Portland	Grant, Henry H.
Thomaston	Greenleaf, Phillip R.
Waterville	Roy, Romeo J.

Maryland

Baltimore	Gorsuch, Charles B.
Baltimore	Kader, Marshall I.
Baltimore	Miksinski, Boleslaw W.
Dundalk	Hanik, Samuel
Elkridge	Toomey, Lewis C., Jr.
Severna Park	Boro, Alex L.
Westminister	Cosimi, Euripides E.

Massachusetts

Arlington	Berquist, John W.
Athol	Dudis, John A.
Boston	Gwinn, George A.
Boston	Tomassian, Carnig
Boston	Vurgaropulos, Arthur C.
Canton	Callery, Charles P.
Chelsea	Steinberg, Jack
Fall River	Matuszak, Valentine I.
Fitchburg	Bachmann, Werner E.
Greenfield	Witek, John J.
Haverhill	Grevis, John
Longmeadow	Rock, Albert C., Jr.
Lowell	Farrington, Donald W.
Lowell	Soreff, Harold
Marblehead	Hosmer, Donald G.
Mattapan	Goldberg, Philip S.
Mattapan	Resnick, Max L.
Medway	Colleary, John C.
Millers Falls	Noga, Charles J.
New Bedford	Poulos, John
North Plymouth	Ortolani, Francis C.
Revere	Goldston, Irving B.
Revere	Kane, Samuel
Roslindale	Doyle, John D.
Roxbury	Cohen, Bernard S.
South Braintree	Sullivan, Thomas J.
Taunton	Hamel, Fernan J. B.
Three Rivers	Pereira, Louis J., Jr.
Ware	Labuz, Charles A.
Westfield	Gillis, John M.
West Roxbury	Hardy, Stephen F.
Winthrop	Fleming, Joseph P.
Woburn	McDonough, Richard T.
Worcester	Goldthwaite, Charles J.
Worcester	Lewis, Jason R.

Michigan

Alpena	Butler, Russell E.
Dearborn	Gucfa, Andrew F.
Dearborn	Gusfa, Walter A.
Dearborn	McBride, Stanley P.
Detroit	Abramson, Sam
Detroit	Berris, Henry H.
Detroit	Godwin, John C.
Detroit	Kopel, Hugh M.
Detroit	Kravetz, Manual R.
Detroit	Levy, Bernard L.
Detroit	Lewandowski, Joseph P.
Detroit	Lovell, Frank R.
Detroit	Monaco, Frank
Detroit	Starman, Nathan
Detroit	Weber, Harry
Detroit	Willis, Sam S.
Detroit	Zonder, Jack
Detroit	Zukowski, Alphonse A.
Grand Rapids	Jason, Paul J.
Grand Rapids	Jelles, Nicholas, Jr.
Grandville	Mulder, Walter, Jr.
Grosse Pointe	Coleman, Robert E.
Hancock	Finch, Wallace G.
Jackson	Jackson, Dwight A.
Laurium	Sibilsky, Robert J.
Negaunee	Bessolo, Savino J.
Port Huron	Smith, Glenn H.
Royal Oak	Baird, George R.
Royal Oak	Bauman, Anthony A.
Sagola	Hayes, Carlin K.
White Cloud	Johanson, Ellis C.
Wyandotte	Bowbeer, Norman N.
Wyandotte	Daskal, David

Minnesota

Albert Lee	Stieler, Philip F.
Chisholm	Bush, James B.
Crosby	Anderson, Allen R.
Delano	Weller, Ralph E.
Duluth	Bouschor, Charles F.
Green Isle	Corcoran, Bartholomew E.
Luverne	Bertrand, Florian R.
Mankato	Mackdanz, Richard A.

Mankato	Renneke, William E.
Minneapolis	Brudnoy, Harry G.
Minneapolis	Elasky, John J.
Minneapolis	Gilbert, Harvey
Minneapolis	Kelsey, Clive G.
Minneapolis	Rydlund, Raymond R.
Minneapolis	Smisek, Ralph I.
Minneapolis	Webster, Grover S.
Minneapolis	Woldum, Lester H.
Montevideo	Anderson, Allan M.
Monticello	Fish, Charles V.
Red Wing	Johnston, David C.
Red Wing	Mossberg, Kenneth E.
Rice	Smoley, Joseph J.
St. Paul	Ganfield, Douglas G.
St. Paul	Goulty, Edgar J.
St. Paul	Rochford, Michael R.
St. Paul	Tomasek, Charles A.
Worthington	Hubert, Henry C.

Mississippi

Brandon	McIntyre, Monroe C.
Grenada	Marascalco, Sam A.
Jackson	Birdsong, Victor L., Jr.
Sedalia	Darnell, James P.

Missouri

Affton	Henke, Charles F., Jr.
Brookfield	Barrick, John B.
Clayton	Miller, Romie H., Jr.
Excelsior Springs	Kimes, Hadley G.
Garden City	Anderson, John G.
Joplin	Barnett, Charles M.
Kansas City	Carroll, John P.
Kansas City	Clark, Richard H.
Kansas City	Hinds, Rollie C.
Maplewood	Bleke, Charles J.
Middletown	Slavens, Forrest R.
Osceola	Barker, Walter L.
Richmond	Stewart, Lloyd B.
St. Joseph	Rosenthal, Mortimer
St. Louis	Barry, Milton W.
St. Louis	Farrell, William M.
St. Louis	Grosby, Jerome S.
St. Louis	Hamm, Kenneth W.
St. Louis	Hunter, Edward H., Jr.
St. Louis	Klie, Walter E.
St. Louis	Kramer, Kalmun K.
St. Louis	Millstone, Robert B.
Springfield	Harlow, William E.

Montana

Livingston	Cloyd, Wallace W.

Nebraska

Alliance	Williams, Walter B.
Atkinson	Hesse, Clarence J.
Broken Bow	Beck, Victor L.
Crawford	Freimuth, Frank F.
Grant	Muffley, Mark P.
Kearney	Boggs, William P.
Lincoln	Hinrichs, Edmund R.
Omaha	Cogan, Edward J.
Omaha	Roughton, Earl E.
Omaha	Spain, Merlin A.

New Hampshire

Dover	Colokathis, Louis
Dover	Markos, Simon G.
Manchester	Grenier, Oliver A.
Pittsfield	McLaughlin, Ralph M.

New Jersey

Atlantic City	McQuade, John S.
Atlantic Highlands	Berezovytch, Roman
Bayonne	Cohen, Saul
Bergenfield	Toffie, John W.
Bloomfield	Marturano, Vincent J.
Clifton	Harris, Lawrence
East Paterson	Norris, Granville M.
Elizabeth	Kozlowski, Stanley L.
Elizabeth	Silverman, Edward
Elmer	Bolnick, Lewis
Englewood	Herbert, Benne S.
Englewood	Joseph, Robert L.
Freehold	Parker, Malcolm M.
Harrison	Lasky, Max
Hoboken	Shiffman, Robert
Jersey City	Fennelly, William A.
Jersey City	Lane, Harvey
Kearny	DeTrolio, James V.
Kearny	Vosper, William J.
Keyport	Goldstein, Sidney M.
Mahwah	Myer, Edward H., Jr.
Newark	Berliss, Leonard H.
Newark	Centanni, Alfonse G.
Newark	Cott, Irving
Newark	Krugman, Leonard
Newark	Rubin, Norman J.
Newark	Sacks, Philip
North Bergen	White, Arnold I.
Nutley	Carter, William P., Jr.
Paterson	Marrocco, Matthew L.
Perth Amboy	Manger, Louis P.
Phillipsburg	Piatt, Edward T.
Red Bank	Marascio, Anthony W.
Roselle Park	DeCesare, Emil J.
South Orange	Protzel, Martin S.
Summit	Genualdi, Frederick B.
Tenafly	Cunningham, James G.
Trenton	Isaacson, Daniel
Washawken	Apfelbaum, Bernard
West New York	Fernhoff, Maurice A.
West Orange	Silverman, William

New Mexico

Albuquerque	Farley, John W.

New York

Adams	Richmond, John E.
Albany	Diekman, Herman J., Jr.
Albany	Skarka, Anthony
Amsterdam	Wasileski, Leonard G.
Batavia	Gautieri, Michael F.
Beacon	Rogen, Louis
Binghamton	Clay, Paul V.
Binghamton	Schmeiske, Lisbon H.
Bronx	Babushkin, Walter
Bronx	Bernstein, Paul
Bronx	Cooper, Louis C.
Bronx	Dubin, George
Bronx	Entelis, Stanley
Bronx	Goldberg, Joseph D.
Bronx	King, Louis N.
Bronx	Klahr, Sidney H.

Bronx	Marcus, Nathan R.
Bronx	Newman, Saul
Bronx	Nussbaum, Philip
Bronx	Platt, Nathan
Bronx	Roskind, Raymond R.
Bronx	Shleffar, Irvin E.
Bronx	Simon, Isadore A.
Bronx	Taft, Leo L.
Brooklyn	Abrams, Irving
Brooklyn	Anderman, Irving I.
Brooklyn	Barb, Julius C.
Brooklyn	Barron, Irving R.
Brooklyn	Bennett, Arnold N.
Brooklyn	Bernstein, Harry
Brooklyn	Bevilacque, Thomas J.
Brooklyn	Blakeman, Arthur H.
Brooklyn	Bodkin, Francis F.
Brooklyn	Brodsky, Bernard
Brooklyn	Cobin, Harold P.
Brooklyn	Cosgrove, Joseph J.
Brooklyn	Curcio, Emil L.
Brooklyn	Dibitetto, Nicholas M.
Brooklyn	Ehrens, Joel
Brooklyn	Einzig, Alfred A.
Brooklyn	Eisenstark, Julius
Brooklyn	Elias, Joseph R.
Brooklyn	Fagelman, Jacob
Brooklyn	Fink, Irving M.
Brooklyn	Flachner, Stanley J.
Brooklyn	Fox, Melvin
Brooklyn	Franklin, Gilbert P.
Brooklyn	Glickman, Joseph
Brooklyn	Goldberg, Ambrose A.
Brooklyn	Goldberg, Sam
Brooklyn	Goldstein, Edward
Brooklyn	Goldstein, Hyman
Brooklyn	Greenberg, Raymond A.
Brooklyn	Greene, Bernard J.
Brooklyn	Gruber, Irving E.
Brooklyn	Holappa, Samuel J.
Brooklyn	Horowitz, Abraham H.
Brooklyn	Kahm, Joseph
Brooklyn	Kaplan, Jacob I.
Brooklyn	Kaufman, Morton L.
Brooklyn	Kelman, Irving
Brooklyn	Kirschner, Morris S.
Brooklyn	Lamstein, Abraham
Brooklyn	Leibowitz, Bernard B.
Brooklyn	Lomuscio, Richard J.
Brooklyn	Lyons, Herbert I.
Brooklyn	Madow, Irving
Brooklyn	Moss, Carl A.
Brooklyn	Nemoytin, Sidney W.
Brooklyn	Okun, Arthur A.
Brooklyn	Pfefferman, Max
Brooklyn	Rabinow, Sidney
Brooklyn	Riccardelli, William J.
Brooklyn	Rifkin, Herman
Brooklyn	Ritt, Robert
Brooklyn	Rothenberg, Ephriam A.
Brooklyn	Salkind, Albert
Brooklyn	Schwartz, Alfred
Brooklyn	Shapiro, Eli
Brooklyn	Silverman, Milton
Brooklyn	Small, Philip
Brooklyn	Spiselman, Phillip P.
Brooklyn	Strauss, Saul R.
Brooklyn	Svadjian, Stephen G.
Brooklyn	Thaller, Jack L.
Brooklyn	Tolvin, Ira
Brooklyn	Weiss, David S.
Brooklyn	Zahn, Julius
Brooklyn	Zipperman,Nathan
Brooklyn	Zlotoff, Bertram B.
Buffalo	Clough, Harry E.
Buffalo	Muriella, George D.
Dannemora	LaMar, Harmon T.
Douglaston	Kissane, John J.
Elmhurst	Hoffman, Israel
Elmhurst	Miller, Sidney
Far Rockaway	Agress, Bernard D.
Ferndale	Pollack, Abraham J.
Flushing	Faerber, Bert S.
Flushing	Feldman, Samuel B.
Flushing	Kantor, Albert
Forest Hills	Egan, George F.
Forest Hills	Kornreich, Nathaniel H.
Forest Hills	Matigan, Armen
Frankfort	Marine, James J.
Franklin Square	Grebin, Irving
Freeport	Goldstein, David S.
Harriman	Petersen, Thomas S.
Hartsdale	Jacobson, Sidney
Hempstead	Friedman, Elias
Hempstead	Greene, Lewis L.
Hempstead	Jacobson, Burton R.
Ilion	Francis, James L.
Ithaca	Bohland, Bernard S.
Ithaca	Visnyei, George J.
Jamaica	Booker, Elbert L.
Jamaica	Kolson, Harry
Jamaica	Shapiro, Eugene
Jamaica	Wolfram, Robert S.
Kew Gardens	Bodner, Bernard N.
Kew Gardens	Stark, Alfred B.
Lockport	Downes, Robert L.
Long Island City	Binder, Abraham M.
Mamaroneck	Wallach, Irving
Massena	McCann, John R.
Mechanicville	Gargano, Frank J.
Mountain Dale	Forman, Arthur S.
Mt. Vernon	Crain, Samuel E.
Mt. Vernon	Finiello, Vincent
Mt. Vernon	Kaufman, William
Mt. Vernon	Seidel, Abraham
Newburgh	Kirkland, Herbert D., Jr.
New Rochelle	Chayes, Charles M.
New Rochelle	Jordan, Sydney L.
New York	Alberg, Ralph
New York	Bartell, Arnold A.
New York	Becker, Edward
New York	Belgorod, Howard H.
New York	Benrey, Irwin I.
New York	Bernhak, Abraham I.
New York	Biscow, Edgar B.
New York	Blumenfeld, Arthur
New York	Brandstein, Philip L.
New York	Breiner, John
New York	Capra, Michael A.
New York	Carlucci, Joseph P.
New York	Cassara, Salvatore J.
New York	Corwin, Herman J.
New York	Dacunto, Anthony T.
New York	Davidoff, Leonard M.
New York	DiMatteo, Albert J.
New York	Eisenbud, Leon

New York	Falkin, Rudolph J.
New York	Fink, Oscar C.
New York	Finkelman, Irving D.
New York	Fischbein, Melvin W.
New York	Freeman, Lester W.
New York	Gettenberg, Gustave
New York	Glaser, Isadore A.
New York	Gluck, Robert
New York	Gold, Harold A.
New York	Halpern, Jacob
New York	Harrow, Max W.
New York	Jackson, Sidney R.
New York	Karmiol, Mortimer
New York	Kaufman, Sidney
New York	Kelmans, Milton
New York	Klein, Morris N.
New York	Kushner, Jack
New York	Kutcher, Joseph M.
New York	Leventhal, J. Alexander
New York	Lieppe, George
New York	Mack, Daniel H.
New York	Manberg, David J.
New York	Marcus, Victor
New York	Mason, Charles
New York	Mintzer, Marcus A.
New York	Mollin, Abraham D.
New York	Pentel, Max B.
New York	Relkin, Bernard
New York	Ross, Milton
New York	Rucker, Joseph
New York	Schapiro, Bertram W.
New York	Schultz, Irving
New York	Schwaid, Benjamin N.
New York	Schwartz, Milton B.
New York	Siegel, Ralph
New York	Simms, Harold
New York	Stein, Alex
New York	Topilow, Jacob S.
New York	Tylman, Sam M.
New York	Vidair, Robert
New York	Wallach, Mark A.
New York	Weinstock, Samuel
New York	Weiss, Harold
New York	Wilson, Jack
New York	Winder, Raymond A.
New York	Yavelow, Issacher
New York	Zullo, Salvatore V.
New York	Zweben, David D.
Oceanside	Renselaer, Robert F.
Port Chester	Mintzer, Samuel L.
Port Chester	Morgan, Leon I.
Potsdam	Fliegel, Saul L.
Poughkeepsie	Tinkelman, Abraham H.
Red Hook	Dillman, Louis G.
Red Hook	Michael, George F.
Rich Hall	Green, Leonard
Rochester	Bentham, William L.
Rochester	Kowal, Michael
Rome	Gillis, Robert J.
Rome	Sinclair, Donald L.
St. Little Valley	Carr, James M.
Sayville	Black, John A.
Sayville	Van Bomel, Olaf W.
Scarsdale	Powell, Henry J.
Schenectady	Finkel, Maxwell E.
Schenectady	Nelarico, Anthony T.
Schenectady	Reid, Lester F.
Schenectady	Schlansker, William P.
Staten Island	Hulnick, Alvin
Suffern	Maged, Howard E.
Sunnyside	Hamberg, Harvey U.
Syracuse	Markham, Frederic H.
Tompkinsville	Berman, Melvin G.
Tuckahoe	Kerrigan, Joseph N.
Utica	Levinson, Leonard
Valhalla	DeMartini, Walter
Valley Stream	Eldered, Seaman H.
Wards Island	Kellar, Sidney
Watertown	Danforth, Albert L.
Yonkers	Baker, Thomas J.

North Carolina

Boone	Farthing, Joseph C.
Charlotte	Hoffman, Milo J.
Hamlet	Edwards, Alton B.
Mooresboro	Cantrell, John W.
Raleigh	Woody, Frank S.

North Dakota

Lisbon	McNally, John G.
Minot	Smith, Chester D.
Washburn	Klein, Ernest T.

Ohio

Ada	Enterline, Jack M.
Ansonia	Martin, John E.
Ashtabula	Turano, Italo T.
Bellevue	Bates, Nelson C.
Bucyrus	Jaffee, Ralph A.
Chillicothe	Dimity, William A.
Circleville	Goeller, Joseph E.
Cleveland	Andersen, Norman T.
Cleveland	Cooke, Lyndon E.
Cleveland	Dusek, Earl L.
Cleveland	Gordon, Samuel R.
Cleveland	Greenfield, Joe S.
Cleveland	Katz, Nathan
Cleveland	Kelly, Henry E. K.
Cleveland	Klein, Reuben S.
Cleveland	Kuhar, George M.
Cleveland	Natherson, Everett S.
Cleveland	Silverman, Lewis
Cleveland	Stein, Albert E.
Cleveland	Stern, Max F.
Cleveland	Stosak, Stephan L.
Columbus	Cooper, Max B.
Coshocton	Hahn, Carl W.
Cuyahoga Falls	Body, Lowell H.
Dayton	Eib, Paul B.
Dayton	Reiling, John A.
Jackson	Flemington, William R.
Lakewood	Hall, Wilfred B.
Lakewood	Lutsch, Walter M.
Lancaster	O'Grady, Charles S.
Lebanon	Gilby, Ray F.
Lima	Bruck, Wilfred L.
London	Laybourne, Raymond F.
Manchester	Sharon, Irving M.
Norwalk	Gibbons, Paul M.
Oxford	Barkley, Robert S.
Rocky River	Moore, George S.
Strasburg	Hostetler, Glenn F.
Toledo	Arthur, Robert B.
University Heights	Hoffman, Max D.
Youngstown	Blair, Thomas L.

Youngstown	Schiavone, Guido E.
Zanesville	Pope, Clarence M.
Zanesville	Scheffler, Roy T.

Oklahoma

Bartlesville	Born, Harold S.
Duncan	Moore, Milton L.
Edmond	Hurt, William J.
Kingfisher	Jersak, William R.
McAlester	Baden, Louis J.
Perry	Boyer, Otha W.
Ponca City	Moore, Robert L.
Tahlequah	Thorne, Thomas V.
Wilburton	Harris, Jesse M., Jr.

Oregon

Baker	Duff, Thomas V.
Bandon	McNair, Raymond W.
Portland	Brandon, David B.
Portland	Gilmore, Todd
Portland	Henderson, Donald B.
Portland	Lainhart, Porter W.

Pennsylvania

Abington	Bushnell, William W.
Aliquippa	Byers, James W.
Allentown	Bastian, Thomas C.
Allentown	Weiner, Edward
Avalon	Beal, Edmund S.
Bangor	Tirgiani, Nicholas E.
Beaver Falls	Soodik, Benjamin M.
Berlin	Prugh, Harry C., Jr.
Bloomsburg	Sober, Clarence W.
Carnegie	Cunningham, John B.
Chester	Omenn, Edward
Connellsville	Pujia, William A.
Drexel Hill	Houck, Joseph F.
Duquesne	Silberman, Raphael R.
Erie	Kreider, Raymond L.
Franklin	Bailey, John W.
Germantown	Budzik, Walter M.
Greenville	Knapp, Lloyd R.
Grove City	Courtice, Allyn J.
Harrisburg	Rhein, William L.
Harrisburg	Whitmoyer, Jerome H., Jr.
Johnstown	Wendell, Charles A.
Lemoyne	Pursel, William T.
Lock Haven	Williams, Victor L.
McConnellsburg	Hohman, Daniel L.
Monessen	Cramer, Paul E.
New Castle	Fisher, Merle J.
New Kensington	Gordon, Lester J.
Norristown	Sablosky, Mark J.
Oakmont	Lundstrom, Robert W.
Olyphant	Murphy, Leo P.
Philadelphia	Beckley, John H., Jr.
Philadelphia	Belasco, Emanuel
Philadelphia	Bernstein, Lewis N.
Philadelphia	Clark, Thomas J.
Philadelphia	Cohen, Lester
Philadelphia	Deitch, Jacob
Philadelphia	DeStefano, Thomas M.
Philadelphia	Entine, Bernard J.
Philadelphia	Friedman, Joseph N.
Philadelphia	Gershkow, Edward I.
Philadelphia	Glick, Daniel O.
Philadelphia	Goldman, Reuben
Philadelphia	Kaniss, Morris W.
Philadelphia	Kaplan, Benjamin
Philadelphia	Karpinski, Henry S.
Philadelphia	Keil, Charles B.
Philadelphia	Langsfeld, Morton A., Jr.
Philadelphia	Lewandowski, Edward H.
Philadelphia	McBride, James D.
Philadelphia	Marks, Leon E.
Philadelphia	Michaels, Abraham
Philadelphia	Packer, Harvey
Philadelphia	Perri, Anthony J.
Philadelphia	Shapiro, Solomon
Philadelphia	Spielberger, Jerome G.
Philadelphia	Stein, Irving
Philadelphia	Stockberger, Elmer C., Jr.
Philadelphia	Stout, Harry J., Jr.
Philadelphia	Upstein, Lewis
Philadelphia	Weiser, Albert
Pittsburgh	Fried, Joseph H.
Pittsburgh	Fundenberg, Morris M.
Pittsburgh	Gardner, Paul E.
Pittsburgh	Grauer, Jacob C.
Pittsburgh	Levine, Donald L.
Pittsburgh	Spiegel, Bernard
Schaefferstown	Zimmerman, John B.
Schwenkville	Markley, Morris D.
Scranton	Newman, Joseph
Shamokin	Bruskey, Edward R.
Shamokin	Konopka, John M.
Sharon	Flocco, Edmond F.
Spangler	Denny, Harry B.
Sunbury	Drumheller, John H.
Tamaqua	Hermany, Milton S.
Tarentum	Alter, John R.
Uniontown	Nixon, Edgar C.
Upper Darby	Courtman, Meier H.
West View	Hay, Lewis, Jr.
Wind Gap	Dreher, Mahlon W.

Puerto Rico

Yauco	Roura, Alejandro

Rhode Island

Bristol	Grossman, Max B.
East Providence	Clancy, Lawrence A.
Providence	Capone, Joseph A.
Providence	Meshnik, Bernard H.
Providence	Pomiansky, Louis

South Carolina

Lake City	Cockfield, Jamie H.

Tennessee

Chattanooga	Park, Madison J.
Memphis	Anderson, Murray O.
Memphis	Jones, Fred S.
Morristown	Bruce, Everette W.
Sevierville	Wilson, Cas P., Jr.
Springfield	Swann, Joseph E.

Texas

Austin	Eitel, Charles M.
Dallas	Fox, Abe A.
Denison	Elmore, Choice B.
Fort Bliss	Cardamon, Albert J.
Gorman	Brandon, Joseph B.
Houston	Christiansen, Wayne F.
Lubbock	Jennings, Charles W.
Mason	Ingledue, Paul O.

San Antonio	Baumgartner, Walter J.
San Antonio	Klein, Saul B.
Sanger	Cooksey, Barney C.
Sulphur Springs	Gee, Jesse M.
Terrell	Holton, Robert W., Jr.
Utah	
Bingham Canyon	Joseph, Lewis C.
Ogden	Branz, Louis M.
Virginia	
Galax	Hampton, C. L.
Lynchburg	Brooks, Benjamin L., Jr.
Norfolk	Eggleston, John R., Jr.
Richmond	Bradenhan, Ulpian G.
Richmond	Richardson, George B.
Washington	
Medical Lake	Hill, Roy C.
Prosser	Basford, Harry F.
Redondo	Libbey, Howard R.
Seattle	Smith, Richard L.
Seattle	Weeth, Henry O.
Spokane	Newby, James W.
Tacoma	Friedman, Abedeaux
West Virginia	
Camden on Gauley	Callahan, John E.
Charleston	Dixon, Arla C., Jr.
Fairview	Gardner, Mont M.
Huntington	Cohen, Philip
Mt. Hope	Garrett, Frank R.
Wisconsin	
Amery	Nelson, Donald O.
Cambria	Swartz, John W.
Clintonville	Shaw, John B.
Columbus	Frey, Wilber C.
Crandon	Ison, Luther A.
Eau Claire	Grewe, Herbert G.
Eau Claire	Lee, Robert E.
Ft. Atkinson	Umland, Carl W.
Madison	Hase, Robert R.
Madison	Hilgert, Ralph M.
Madison	Meng, Myron J.
Marshfield	Laessig, Hubert L.
Milton	Mitchell, Stuart M.
Milwaukee	Benz, Herman S.
Milwaukee	Blaisdell, Henry W.
Milwaukee	Voelker, Edward C.
Milwaukee	Witte, George H.
Milwaukee	Young, Warner R.
Racine	Hay, James A.
Rhinelander	Goosen, Chester P.
Sheboygan	Holman, Eugene
Soldiers Grove	Davidson, Irving J.
Wabeno	Bauman, Oliver H.
Whitehall	Ivers, Simon B.
Wyoming	
Sheridan	Bloom, Everett O.
Superior	Kraft, Raymond H.

LIST OF DENTAL OFFICERS

SEPARATED FROM NAVY DENTAL CORPS

THE following naval dental officers have been separated from service, according to lists received from the Navy Department. These lists are not complete. Other names will be published as soon as possible.

Arizona		
Phoenix	Reeves, Ernest C., Jr.	Lieut.
California		
Fresno	Hibbard, Harold O.	Lt. Cmdr.
Lemoore	Funk, Russell R., Jr.	Lieut.
Los Angeles	Barnett, Robert A.	Lieut.
Los Angeles	Fields, Theodore I.	Lieut.
Los Angeles	Fieth, Wesley A., Jr.	Lieut.
San Francisco	Battagin, Gino	Lieut.
San Francisco	Karsant, George D.	Lt. Cmdr.
San Francisco	Miller, Charles R.	Lieut.
San Francisco	Nahman, Newton J.	Lieut.
San Francisco	Otterstrom, Ralph W.	Lieut.
San Francisco	Schuler, Charles J.	Lieut.
San Francisco	Thurston, James L.	Lieut.
San Francisco	Weikel, Maurice M.	Lieut.
San Francisco	Wemple, Clifton L.	Lt. Cmdr.
San Jose	Hutson, Robert W.	Lieut.
Colorado		
La Veta	Kincaid, Robert D.	Lieut.
Connecticut		
Newington	Lenczyk, Theodore N.	Lieut.
Wallingford	O'Connell, Edward J.	Lieut.
Waterbury	Antczak, Francis A.	Lieut.
West Hartford	Murphy, Daniel W., Jr.	Lieut.
Florida		
Miami Beach	Rose, Arthur M.	Lieut.

Illinois

Belleville	Wilbret, Cornelius L.	Lt. Cmdr.
Benld	Bertoglio, Edwin M.	Lieut.
Chicago	Bingaman, William L.	Lieut.
Chicago	Morros, Joseph L.	Lieut.
Chicago	Weinfield, Edwin E.	Lieut.
Crystal Lake	Gleisten, Howard P.	Lt. Cmdr.
Easton	Shute, John J.	Lieut.
Forrest	Shaddle, Lloyd G.	Lieut.
Lake Forest	Noble, Francis P.	Lieut.
Maywood	McCarthy, Lawrence T.	Lieut.
Monmouth	Sharp, Lee P.	Lieut.
Morris	Foster, Robert D.	Lieut.
Oak Park	Keehn, William H.	Lieut.
Springfield	Gibson, William C.	Lieut.
Springfield	Lambert, Leslie D.	Lieut.
Tamms	Chappell, Douglas E.	Lt. Cmdr.

Indiana

Evansville	Berman, Robert N.	Lieut.
Gary	Grillo, Angelo S.	Lieut.

Iowa

Eddyville	Armstrong, Lloyd M.	Lieut.
Ottumwa	Olmstead, Harold W.	Lieut.

Kansas

Atchison	Heiser, John H.	Lieut.
Kansas City	Potter, Robert H.	Lieut.
Ottawa	Howell, John R.	Lieut.

Kentucky

Louisville	Eskew, Harold A.	Lieut.
Paducah	Harting, John E.	Lieut.

Louisiana

New Orleans	Roberts, Joseph M., Jr.	Lieut.

Maine

Bangor	Sheehan, John W.	Lieut.
Calais	Densmore, Leon F.	Lt. Cmdr.

Maryland

Baltimore	Caldwell, Gilbert L.	Lieut.
Baltimore	Tongue, Raymond K.	Lieut.
Lutherville	Ramsey, Wilbur O.	Lieut.
Silver Spring	Naylor, Merlin E.	Lieut.

Massachusetts

Lowell	Krajewski, Leon	Lt. Cmdr.
Lowell	Sicard, Paul C.	Lieut.
Lynn	Willens, Sumner H.	Lieut.
Lynnfield Center	Williams, Philip	Lt. Cmdr.
Peabody	Kondon, Anthony J.	Lieut.
Pittsfield	Farrell, Joseph W.	Lieut.
Randolph	Maguire, William F.	Cmdr.
Whately	Branch, Charles L.	Lieut.
Worcester	Kentros, George A.	Lieut.

Michigan

Charlevoix	Ance, Lysle D.	Lt. Cmdr.
Detroit	Brake, Arthur J.	Lt. Cmdr.
East Lansing	Nolen, John G.	Lieut.
Grosse Pointe Park	Ruthven, Robert N.	Lieut.
Mason	Bullen, Robert E.	Lieut.
Morenci	Munro, James M.	Lieut.
Mt. Clemens	Millar, Richard H.	Lt. Cmdr.
Port Huron	Touma, Emil	Lieut.
Remus	Fountain, Harold W.	Lieut.
Romeo	Collon, David	Cmdr.
Sturgis	Shaffer, Russel E.	Lt.

Minnesota

Akeley	Davis, Alvin M.	Lieut.
Ely	Skule, John L.	Lieut.
Minneapolis	Noble, Frederick W.	Lieut.

Missouri

Kansas City	Nutz, James F.	Lieut.
St. Louis	Kenkel, Marvin J.	Lieut.
St. Louis	Petkovich, Ogden L.	Lt. Cmdr.
Seymour	Johnston, Glenn W.	Lieut.
Webster Groves	Croghan, Edward M.	Lieut.
Webster Groves	Haferkamp, Elmer E.	Lt. Cmdr.

Montana

Butte	Guay, Edgar J.	Lieut.
Great Falls	Akland, Richard H.	Lieut.

Nebraska

Adams	Gates, Milton B.	Lt. Cmdr.
Geneva	Steinacher, Raymond H.	Lieut.
Lincoln	Bergen, Samuel F.	Lt. Cmdr.
Omaha	Fritz, Thomas H.	Lieut.
Omaha	Kutler, Benton	Lieut.
Omaha	Swoboda, Edgar A.	Lieut.
Omaha	Turkel, Ralph G.	Lieut.

New Hampshire

Keene	Jenkins, Donald E.	Lieut.

New Jersey

Elizabeth	McCue, Matthew C.	Lieut.
Englewood	Arnold, John F.	Lieut.
Garfield	Kunkel, Everett E.	Lieut.
Glen Ridge	Heindel, John K.	Lieut.
Hackensack	Ring, Howard R.	Lieut.
Jersey City	Cangero, Raymond L.	Lieut.
Jersey City	Hennesey, Charles C. W.	Lieut.
Newark	Fechtner, Jerome L.	Lieut.
Newark	Witzberg, Fred J.	Lieut.
Oradell	Vierling, Lester H.	Lieut.
Paterson	Jurewicz, Felix J.	Lieut.
Vineland	Trabuchi, John P.	Lt. Cmdr.

New York

Bronx	Markowitz, Joseph R.	Lieut.
Brooklyn	Agins, Theodore C.	Lieut.
Brooklyn	Barattini, John A.	Lt. Cmdr.
Brooklyn	Eisman, Norman N.	Lieut.
Brooklyn	Jagard, Walter J.	Lieut.
Brooklyn	Schwartz, Norman	Lieut.
Brooklyn	Siegel, Allan D.	Lt. Cmdr.
Brooklyn	Zuckerman, Edward	Lieut.
Buffalo	Millstone, Harold C.	Lieut.

Clayton	Gillick, George O.	Lieut.
Flushing	Stephen, Kirk A.	Lieut.
Gloversville	Rubin, Moses A.	Lieut.
Merrick	Coyle, James G.	Lieut.
Mineola	Latham, Ralph W., Jr.	Lieut.
New Rochelle	Titus, Ralph L.	Lieut.
New York	Asch, John J.	Lieut.
New York	Bitteto, James V.	Lieut.
New York	Braun, Andrew	Lt. Cmdr.
New York	Hudis, Morris M.	Lieut.
New York	Ihle, Arthur W.	Lt. Cmdr.
New York	Koteen, Seymour L.	Lt. Cmdr.
New York	Richter, John W.	Lt. Cmdr.
New York	Tirk, Theodore M.	Lieut.
New York	Yellin, Jacob L.	Lieut.
Oceanside	Stone, Billy N.	Lieut.
Oneida	Silverman, Herbert J.	Lt. Cmdr.
Rochester	Pfeiffer, Leo W.	Lieut.
Sherrill	Pawlicki, Eugene S.	Lieut.
North Carolina		
Raleigh	Stone, Fleming H.	Lieut.
North Dakota		
Mandan	Braxmeier, Luke J.	Lieut.
Ohio		
Cleveland	Andel, Frank J.	Lieut.
Cleveland	Lester, Isadore H.	Lieut.
Cleveland Hts.	Verovitz, Daniel	Lieut.
Columbia Station	Smithson, Robert A.	Lieut.
Columbus	Cole, Leonard L.	Lieut.
East Liverpool	Turner, Arthur A.	Lieut.
Lima	Crites, John C.	Lieut.
Toledo	Frobase, Edward N.	Lieut.
Waverly	Wills, Richard V.	Lieut.
Oklahoma		
Blair	Voelkle, Albert	Lieut.
Guthrie	Hirschi, Robert H.	Lieut.
Tulsa	Caudle, Benjamin D.	Lieut.
Oregon		
Grand Ronde	Lentz, Russell W.	Lieut.
Portland	Blackmore, Weldon A.	Lt. Cmdr.
Portland	Green, Kitt P.	Lieut.
Portland	Hasson, Milton	Lieut.
Portland	Short, Richard W.	Lieut.
Springbrook	Macy, Maynard O.	Lieut.
Pennsylvania		
Berwick	Taylor, James B.	Lt. Cmdr.
Dormont	Sturm, George	Lieut.
Doylestown	Siegler, John R.	Lieut.
Lebanon	Long, Robert K.	Lieut.
Oil City	Moore, LeRoy E.	Lieut.
Philadelphia	Hovsepian, Martin	Lt. Cmdr.
Philadelphia	Warren, Harvey C.	Lieut.
Pittsburgh	Adamchic, Joseph P.	Lieut.
Pittsburgh	Haase, Louis G.	Lieut.
Pittsburgh	Hutton, Edward G.	Lieut.
Ridgway	Moore, Herbert L.	Lieut.
Rural Valley	Stewart, Craig A.	Lt. Cmdr.
Shenandoah	Kerewich, Eugene L.	Lieut.
South Ardmore	Davis, Robert W.	Lieut.
Wayne	Berg, John J.	Lieut.
Rhode Island		
Providence	O'Brien, Michael J.	Lieut.
South Carolina		
Charleston	Hamrick, Clarence T., Jr.	Lieut.
South Dakota		
Redfield	Walston, William E.	Lt. Cmdr.
Tennessee		
Clinton	Sherard, James H.	Lieut.
Covington	Younger, William M.	Lieut.
Dyersburg	Thomas, James V.	Lieut.
Texas		
Dallas	Spann, S. E. W., Jr.	Lieut.
Houston	Feeney, John L.	Lt. Cmdr.
McLean	Finley, James E.	Lieut.
Plainview	Coleman, E. T., Jr.	Lieut.
Utah		
Layton	Rampton, Jack A.	Lieut.
Midvale	Beckstead, Paul C.	Lieut.
Provo	Kelly, Ralph S.	Lieut.
Vermont		
Barre	Cenci, Novello N.	Lieut.
Virginia		
Cleveland	Jessee, Edgar F.	Lieut.
Hampton	White, Joseph P., Jr.	Lt. Cmdr.
Washington		
Seattle	Cohen, Leonard J.	Lieut.
Seattle	Empenger, Dan H.	Lieut.
West Virginia		
Fairview	Lemley, Kenneth E.	Ens.
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Wyoming		
Cheyenne	Carson, Charles K., Jr.	Lieut.

DEATHS

Justis, Joseph Stanley, Memphis, Tenn.; died July 29; aged 43.

A former vice-president of the Tennessee State Dental Association, Dr. Justis was well known in dental circles in Memphis and the Mid-South. He was an attendant in dental surgery at John Gaston Hospital and was noted for his skill as a surgeon, as well as in other fields of dentistry.

Born in Dyersburg, Tenn., Dr. Justis attended schools there and was graduated from the College of Dentistry, University of Tennessee. He was a reserve officer in the Dental Corps and was called into service as a lieutenant early in 1942. Since his discharge, he had maintained dental offices in Memphis.

He was a member of the American Dental Association and Xi Psi Phi, national dental fraternity, and had been an executive councilman for the Tennessee State Dental Association for several years.

Alexander, William G., Seattle; School of Dentistry, North Pacific College of Oregon, 1904; died August 1; aged 70.

Atkinson, A. S., Detroit; Pennsylvania College of Dental Surgery, 1890; died in May.

Barcus, James M., Carlinville, Ill.; School of Dentistry, Temple University, 1883; died August 20; aged 85.

Bedell, Elmont W., Metuchen, N. J.; School of Dentistry, Temple University, 1910; died August 6; aged 61.

Bird, Stephen T., Princeton, W. Va.; School of Dentistry, University of Louisville, 1909; died July 30.

Bowie, Ralph A., Three Rivers, Mich.; College of Dental Surgery, University of Michigan, 1901; died August 3; aged 73.

Burns, Donald, Newton, Mass.; died August 6; aged 35.

Cail, Thomas W., Newton Highlands, Mass.; Tufts College Dental School, 1902; died July 29; aged 60.

Cheek, Marshall R., Dallas, Texas; College of Dentistry, Baylor University, 1925; died August 4; aged 47.

Collin, Samuel W., Pitman, N. J.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1902; died August 10.

Deatrick, David P., Middletown, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1902; died August 7; aged 66.

Desmarais, Hervey L., Southbridge, Mass.; died August 4; aged 60.

Duffy, William A., New Haven, Conn.; School of Dentistry, Georgetown University, 1914; died August 1; aged 56.

Foley, John J., Jr., Canonsburg, Pa.; died August 6; aged 49.

Freeman, Edward A., Reading, Mass.; Tufts College Dental School, 1899; died August 4; aged 69.

Gill, Edgar S., Utica, N. Y.; School of Dentistry, University of Buffalo, 1905; died August 8.

Griffin, Joe R., Clarksburg, W. Va.; School of Dentistry, University of Pittsburgh, 1925; died July 28; aged 42.

Hanford, William H., Oakland, Calif.; College of Dentistry, University of California, 1913; died August 1; aged 57.

Helmer, John L., Indianapolis; Chicago College of Dental Surgery, Dental Department of Loyola University, 1902; died August 6; aged 67.

Hope, William T., Baxter Springs, Kan.; Kansas City Dental College, 1913; died July 6; aged 64.

Jarvis, G. W., Slater, Mo.; School of Dentistry, Washington University, 1889; died July 12; aged 83.

Kelley, C. M., El Dorado, Kan.; Kansas City-Western Dental College, 1916; died August 5; aged 51.

Kimball, J. A., Idaho Falls, Idaho; Chicago College of Dental Surgery, Dental Department of Loyola University, 1910; died August 4; aged 59.

Kuster, Samuel W., Elgin, Iowa; Chicago College of Dental Surgery, Dental Department of Loyola University, 1900; died August 15; aged 70.

Lackey, Oscar H., Indianapolis; School of Dentistry, Indiana University, 1908; died August 9; aged 60.

LeVanseler, Bert C., St. Johns, Mich.; College of Dental Surgery, University of Michigan, 1905; died July 19; aged 67.

Line, Clinton E., Lakeville, N. Y.; College of Dentistry, Western Reserve University, 1902; died August 8; aged 68.

Lopez, Joseph R., Philadelphia; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1917; died August 6; aged 51.

Lowrey, Harry B., Senecaville, Ohio; died in August; aged 83.

McFarren, Walter J., Canton, Ohio; died July 11; aged 52.

McKay, Walter N., Winter Haven, Fla.; Dental School, Northwestern University, 1892; died July 26; aged 90.

March, Harry, Walled Lake, Mich.; died August 12; aged 47.

Martin, James J., New York; College of Dental and Oral Surgery of New York, 1911; died August 18; aged 58.

Miller, Calvin L., South Bend, Ind.; School of Dentistry, Indiana University, 1916; died August 16; aged 54.

O'Connor, L. J., Edina, Mo.; Western Dental College, 1911; died July 24; aged 70.

Porcelli, Edward, New York; died August 4; aged 42.

Praed, Nicholas F., Mine Hill, N. J.; Baltimore College of Dental Surgery, 1905; died August 8.

Rice, Walter D., New Brunswick, N. J.; died August 6; aged 78.

Sharkey, Patrick H., Bayonne, N. J.; School of Dentistry, Georgetown University, 1916; died August 13.

Shasky, O. S., Minneapolis; died August 18; aged 47.

Sinks, O. F., Tulsa, Okla.; Dental School, Northwestern University, 1901; died August 1; aged 68.

Smith, Arthur G., Peoria, Ill.; Dental School, Harvard University, 1894; died July 24; aged 74.

Smith, Walter C., Buffalo, N. Y.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1909; died August 5; aged 62.

Snyder, J. Willard, Omaha, Nebr.; died August 16; aged 46.

Strickler, Roy G., Paterson, N. J.; Dental School, Harvard University, 1913; died August 11; aged 52.

Sturgis, Earl B., Bluffton, Ind.; College of Dentistry, Ohio Medical University, 1902; died August 7; aged 67.

Sweeney, John J., Yonkers, N. Y.; New York College of Dentistry, 1897; died August 6; aged 54.

Taylor, Henry C., Toledo, Ohio; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1894; died August 2; aged 75.

Thomas, Mitchell, Stearns, Ky.; died July 23; aged 63.

Torrey, Joseph D., Garfield, N. J.; School of Dentistry, Temple University, 1907; died August 14.

Tydings, Edward E., Columbia, Mo.; Western Dental College, 1903; died June 21; aged 71.

Van Saun, Samuel W., Sparta, N. J.; New York College of Dentistry, 1900; died July 21; aged 66.

Vinje, Osmond, Chicago; Chicago College of Dental Surgery, Dental Department of Loyola University, 1910; died July 27; aged 71.

Waddell, Ralph W., Greenfield, Ohio; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1898; died July 17; aged 70.

Walet, Perry H., Loreauville, La.; Atlanta Dental College, 1917; died July 21; aged 54.

Walser, C. R., Anna, Ill.; School of Dentistry, University of Louisville, 1897; died July 10.

Walton, Willis A., Ontario, Calif.; College of Dentistry, University of Southern California, 1920; died July 16; aged 55.

Washburn, L. E., Phillips, Wis.; School of Dentistry, Marquette University, 1918; died July 20; aged 53.

Way, S. F., Livingston, Mont.; School of Dentistry, North Pacific College of Oregon, 1922; died July 29; aged 84.

Westedt, E. H., Loganville, Wis.; Chicago College of Dental Surgery, Dental Department of Loyola University, 1919; died July 21; aged 57.

Wilson, F. B., Sodus, N. Y.; School of Dentistry, University of Buffalo, 1903; died July 30.

Wilson, George W., Greenville, Ill.; School of Dentistry, St. Louis University, 1916; died July 16; aged 62.

Winston, Warwick, San Francisco; died June 27; aged 82.

Wolfe, Oliver T., Boston; Dental School, Harvard University, 1898; died August 8; aged 72.

Wood, Jacob E., Oakland City, Ind.; School of Dentistry, Indiana University, 1911; died August 4.

Woodruff, I. H., Kokomo, Ind.; died July 12; aged 79.

Woods, John Y., Connellsville, Pa.; School of Dentistry, University of Pittsburgh, 1901; died August 3; aged 67.

Young, Roy M., Evanston, Ill.; Dental School, Northwestern University, 1912; died July 8.

Zimmerman, John W., Salisbury, N. C.; Southern Dental College, 1911; died June 1; aged 65.

ANNOUNCEMENTS

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	April 8-10, 1947	Birmingham	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Arizona			R. D. McDonald	Rm. 601, Valley Bk. Bldg., Tucson
Arkansas	May 19-21, 1947	Little Rock	I. M. Sternberg	Merchants Bk. Bldg., Ft. Smith
California	April 28-30, 1947	San Francisco	L. E. Linehan	450 Sutter, San Francisco
S. California			R. L. Borland	Rm. 615, 1052 W. Sixth St., Los Angeles
Colorado			M. R. Markley	Republic Bldg., Denver
Connecticut			E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware			J. Krygier	309 S. State St., Dover
D. of Columbia			M. E. Colvin	1726 21st St., N.W., Washington
Florida	Nov. 11-13	Palm Beach	A. J. Fillastre	603 Marble Arcade, Lakeland
Georgia			R. H. Murphy	605 Bankers Ins. Bldg., Macon
Hawaii	Oct. 29-Nov. 3	Honolulu	J. H. Dawe	P. O. Box 39, Honolulu
Idaho			H. Miller	Moscow
Illinois			L. H. Jacob	Jefferson Bldg., Peoria
Indiana	May 19-21, 1947	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 6-8, 1947	Des Moines	A. N. Humiston	417 Higley Bldg., Cedar Rapids
Kansas	May 12-15, 1947	Kansas City, Mo.	F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky	March 31-April 2, 1947	Louisville	J. L. Walker	640 Barbee Way, S., Louisville
Louisiana	April 10-12, 1947	New Orleans	J. S. Bernhard	407 Med. Arts Bldg., Shreveport
Maine			A. H. Garcelon	State House, Augusta
Maryland	May 5-6, 1947	Baltimore	J. H. Shackelford	706 Baltimore Life Bldg., Baltimore
Massachusetts	May 5-8, 1947	Boston	P. E. Adams	106 Marlborough St., Boston
Michigan			F. Wertheimer	Mich. Dept. of Health, Lansing
Minnesota	Feb. 24-26, 1947	Minneapolis	L. M. Cruttenden	498 Lowry Med. Arts Bldg., St. Paul
Mississippi	June 1-4, 1947	Biloxi	O. L. Colee	Magnolia
Missouri	May 12-15, 1947	Kansas City	C. W. Digges	Exchange Natl. Bk. Bldg., Columbia
Montana	May 1-3, 1947	Missoula	C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 12-14, 1947	Lincoln	F. A. Pierson	Federal Securities Bldg., Lincoln
Nevada			L. G. Jacob	601 Med. Dent. Bldg., Reno
New Hampshire	June 15-17, 1947	Portsmouth	F. E. Williams	814 Elm St., Manchester
New Jersey	April 27-30, 1947	Atlantic City	J. G. Carr	223 E. Hanover St., Trenton
New Mexico	May 26-28, 1947	Santa Fe	J. S. Eilar	First Natl. Bk. Bldg., Albuquerque
New York	May 13-16, 1947	Buffalo	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina			C. W. Sanders	Benson
North Dakota			F. A. Maides	Grand Forks
Ohio	Nov. 11-13	Columbus	E. C. Mills	220 S. Cassady Ave., Columbus
Oklahoma	April 13-16, 1947		E. Wise	Med. Arts Bldg., Tulsa
Oregon			W. H. Hurley	Selling Bldg., Portland
Panama Canal Z.			I. Buchin	Post Dent. Surgeon, APO 834, c/o PM, New Orleans
Pennsylvania	May 6-8, 1947	Philadelphia	E. R. Aston	421 Market St., Kingston
Philippine I.			G. A. Carreon	9 Broadway, Third St., N., Manila
Puerto Rico			J. O. Porrate	16 Caribe, Santurce
Rhode Island	Jan. 20-22, 1947	Providence	M. S. Messore	707 Union Trust Bldg., Providence
South Carolina	April 27-29, 1947	Myrtle Beach	J. R. Owings	Greenville

South Dakota	May 29-31, 1947	Custer	E. W. Elmen	Sioux Falls
Tennessee	May 12-15, 1947	Nashville	E. J. Justis	Exchange Bldg., Memphis
Texas	April 28-May 1, 1947	San Antonio	W. Ogle	813 Med. Arts Bldg., Dallas
Utah			M. G. Kuhre	Trib.-Tel. Bldg., Salt Lake City
Vermont	May 25-27, 1947	Woodstock	J. A. Larrow	Middlebury
Virginia	April 14-16, 1947	Roanoke	J. E. John	804 Med. Arts Bldg., Roanoke
Washington			F. J. Dingler	1502 Med. & Dent. Bldg., Seattle
West Virginia	May 19-21, 1947		C. J. Gavelda	Clarksburg
Wisconsin	March 31-April 2, 1947	Milwaukee	K. F. Crane	1233 Bankers Bldg., Milwaukee 2
Wyoming			J. D. McNiff	Laramie

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
D. of Columbia	Jan. 6-10, 1947	Washington	H. A. Swanson	1726 Eye St., N.W., Washington
Kentucky	Dec. 17-20	Louisville	W. F. Walz	1114 First Natl. Bk. Bldg., Lexington
Maryland	Nov. 11-13	Baltimore	K. W. Preis	700 Cathedral St., Baltimore 1
Michigan	Feb. 3, 1947	Ann Arbor	H. T. Wood	502 David Whitney Bldg., Detroit 26
Mississippi	June 3-5, 1947		W. R. Madden	Forest
New Jersey	Dec. 9-13		W. A. Wilson	150 E. State St., Trenton
Oregon	Oct. 28-Nov. 2	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania	Feb. 17-22,* 1947	Philadelphia	R. E. V. Miller	61 N. Third St., Easton
South Carolina	July 7, 1947	Columbia	E. G. Bumgardner	1517 Hampton St., Columbia 29
Tennessee	Jan. 20-24, 1947	Memphis	J. J. Vaughn	1005 Med. Arts Bldg., Nashville 3
Virginia	Jan. 14, 1947	Richmond	J. M. Hughes	715 Med. Arts Bldg., Richmond 19
Wisconsin	Feb. 10-14, 1947	Milwaukee	S. F. Donovan	Tomah

*Feb. 17-19, written (dental); Feb. 18-19, written (hygienists). Feb. 20-22, clinical (dental); Feb. 20, clinical (hygienists).

OTHER MEETINGS

Name	Date	City	Secy. or Chm.	Address
American Public Health Association	Nov. 11-16	Cleveland	H. J. Knapp Chm.	Health Commissioner, Cleveland
40th Annual Mid-Winter Meeting, Denver Dental Association	Jan. 6-8, 1947	Denver	A. G. Clarke Chm.	611 Republic Bldg., Denver 2
Connecticut Dental Commission	Nov. 19-23	Hartford	C. G. Brooks Recorder	New London
II Congreso Dental Nacional, Cuban Dental Society	Nov. 6-10	Havana	E. Mir Oritz Secy.	Colegio Estomatolog Nacional, Paseo DeMarti 56, Havana
Chicago Dental Society	Feb. 10-13, 1947	Chicago	L. R. Hegland Ex. Secy.	30 N. Michigan Ave., Chicago
Alpha Omega Fraternity, 39th Annual Convention	Dec. 28-Jan. 1, 1947	Detroit	B. E. Gruber Secy.	2180 Bronx Parke, Bronx 60, N. Y.
Detroit District Dental Society	Nov. 4-5	Detroit	F. E. Fleming Chm.	4421 Woodward Ave., Detroit 1
Mid-Continent Dental Congress	Nov. 4-6	St. Louis	E. C. Brooks Chm.	4500 Olive St., St. Louis
St. Louis University, Alumni Association	Nov. 22-23	St. Louis	O. J. Dick	1657 S. Grand Blvd., St. Louis
Dental Hygienists Association of the City of New York	Nov. 1	New York	E. Jaeffa Publicity Chm.	265 W. 94th St., New York 25
Greater New York Dental Meeting	Dec. 9-13	New York	W. S. Bell Chm.	Rm. 106A, Hotel Pennsylvania, New York 1
New York Society of Orthodontists	Nov. 4-5	New York	O. Jacobson Secy.	35 W. 81st St., New York
Pan American Odontological Association, 10th Annual Dinner Meeting	Dec. 11	New York	R. H. Brodsky Ex. Secy.	14 E. 81st St., New York, N. Y.
Greater Philadelphia Annual Meeting, Philadelphia County Dental Society	Feb. 5-7, 1947	Philadelphia	E. H. Smith Chm.	Stock Exchange Bldg., Philadelphia
Dallas Mid-Winter Clinic	Jan. 13-15, 1947	Dallas	B. Ballard, Secy.	1305 Med. Arts Bldg., Dallas

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